



# S7076

Version 1.0

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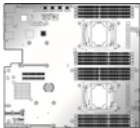

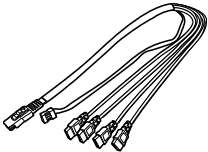



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## Before you begin...

### Check the box contents!

The retail motherboard package should contain the following:

	<b>1 x S7076 Motherboard</b>
	<b>2 x SATA Cable</b>
	<b>1 x Mini-SAS to SATAx4 Cable</b>
	<b>1 x Rear IO Shield</b>
	<b>1 x S7076 Quick reference guide</b>
	<b>1 x TYAN® Driver's and Utilities DVD</b>

### IMPORTANT NOTE:

Sales sample may not come with the accessory listed above.

Please contact your sales representative to help order accessory for your evaluation.



# Chapter 1: Instruction

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## 1.1 Congratulations

You have purchased the powerful TYAN® S7076 motherboard, based on the Intel® C612 chipset. The S7076 is designed to support dual Intel® Xeon E5-2600 v3 series processors, and up to 2048GB LRDIMM 3DS/ 1024GB LRDIMM/ 512GB RDIMM DDR4 memory. Leveraging advanced technology from Intel®, the S7076 is capable of offering scalable 32 and 64-bit computing, high-bandwidth memory design, and lightning-fast PCI-E bus implementation.

The S7076 not only empowers you in today's demanding IT environment but also offers a smooth path for future application upgradeability. All of these rich feature sets provides the S7076 with the power and flexibility to meet demanding requirements for today's IT environments.

Remember to visit the TYAN® website at <http://www.tyan.com>. There you can find all the information on all TYAN® products as well as all the supporting documentation, FAQs, Drivers and BIOS upgrades.

## 1.2 Hardware Specifications

### TYAN S7076 (S7076GM2NR)

Processor	Supported CPU Series	Intel Xeon Processor E5-2600 v3 series
	Socket Type / Q'ty	Socket-R3 (LGA2011) / (2)
	Thermal Design Power (TDP) wattage	Max up to 160W
	System Bus	Up to 9.6/ 8.0/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	PCH	Intel C612
Memory	Supported DIMM Qty	(8)+(8) DIMM slots
	DIMM Type / Speed	RDIMM DDR4 2133/1866/1600 / LRDIMM 3DS DDR4 2133/1600 / LRDIMM DDR4 2133/1600
	Capacity	Up to 2048GB LRDIMM 3DS/ 1024GB LRDIMM/ 512GB RDIMM
	Memory channel	4 Channels per CPU
	Memory voltage	1.2V
Expansion Slots	PCI-E	(2) PCI-E x8 Gen.3 slots
	Recommended TYAN Riser Card	M2091, PCI-E x16 1U riser card (left) / M2103-L8-1L, Proprietary PCI-E 1U riser (right)

	<b>Recommended TYAN Mezzanine Card</b>	M7062-B811-1T, PCI-E Gen3 x8 slot, Broadcom 10GbE Mezz Card / M7062-B810-2T, PCI-E Gen3 x8 slot, Broadcom 10GbE Mezz Card / M7076-IX540-2T, PCI-E Gen3 x8 slot, Intel 10GbE Mezz Card / M7076-12G-8I, PCI-E Gen3 x8 slot, LSI SAS 12G Mezz Card / M7094-6G-8I, PCI-E Gen3 x8 slot, LSI SAS 6G Mezz Card / M7076-6G-8I, PCI-E Gen3 x8 slot, LSI SAS 6G Mezz Card
	<b>Note:</b>	(1) OCP slot for Mezz Card; (1) Proprietary slot for SAS Mezz Card
<b>LAN</b>	<b>Port Q'ty</b>	(2) GbE ports (LAN1 shared with IPMI)
	<b>Controller</b>	Intel I350-AM2
<b>Storage</b>	<b>SATA</b>	(6) SATA* + SGPIO1 (J43) <b>NOTE:</b> SATA0~SATA3 (J41) , SATA 4 (J45), SATA5 (J46)
		<b>Connector</b>
		<b>Controller</b> Intel C612
		<b>Speed</b> 6.0 Gb/s
	<b>sSATA</b>	<b>RAID</b> RAID 0/1/10/5 (Intel RST)
		(4) sSATA* + SGPIO2 (within J42) <b>NOTE:</b> sSATA0~SATA3 (J42)
		<b>Connector</b>
		<b>Controller</b> Intel C612
<b>Graphic</b>		<b>Speed</b> 6.0 Gb/s
		<b>RAID</b> RAID 0/1/10/5 (Intel RST)
		<b>Connector type</b> D-Sub 15-pin
		<b>Resolution</b> Up to 1920x1200
<b>Input /Output</b>	<b>Chipset</b>	Aspeed AST2400
	<b>USB</b>	(3) USB2.0 ports (2 via cable, 1 vertical type-A connector) / (4) USB3.0 ports (2 at rear, 2 via cable)
	<b>COM</b>	(2) ports (COM1 at rear, COM2 via cable)
	<b>VGA</b>	(1) D-Sub 15-pin VGA port
	<b>RJ-45</b>	Total (2) GbE ports, LAN1 shared with IPMI
	<b>Power</b>	SSI 24-pin + 8-pin + 8-pin power connectors
	<b>PSMI</b>	(1) 1x5-pin header
	<b>SATA</b>	(2) SATA-III connectors + (2) Mini-SAS (4-in-1) connectors
	<b>Chipset</b>	Aspeed AST2400
	<b>Voltage</b>	Monitors voltage for CPU, memory, chipset & power supply
<b>System Monitoring</b>	<b>Fan</b>	Total (7) 4-pin headers
	<b>Temperature</b>	Monitors temperature for CPU & system environment
	<b>LED</b>	Over temperature warning indicator / Fan & PSU fail LED indicator
		<b>NOTE:</b> The LED signal is connected to the Front Panel Header on the motherboard. This is the warning led on the front panel board preinstalled in the barebone.

<b>Server Management</b>	<b>Others</b>	Watchdog timer support
	<b>Onboard Chipset</b>	Onboard Aspeed AST2400
	<b>AST2400 IPMI Feature</b>	IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub
	<b>AST2400 iKVM Feature</b>	24-bit high quality video compression / 10/100 Mb/s MAC interface
<b>BIOS</b>	<b>Brand / ROM size</b>	AMI / 16MB
	<b>Feature</b>	User-configurable H/W monitoring / SMBIOS 2.7/PnP/Wake on LAN / PXE boot support / ACPI 3.0/ACPI sleeping states S0,S4,S5
<b>Physical Dimension</b>	<b>Form Factor</b>	EATX
	<b>Board Dimension</b>	12"x13" (305x330mm)
<b>Operating System</b>	<b>OS supported list</b>	Please refer to our Intel OS supported list.
<b>Regulation</b>	<b>FCC (DoC)</b>	Class A
	<b>CE (DoC)</b>	Yes
<b>Operating Environment</b>	<b>Operating Temp.</b>	10° C ~ 35° C (50° F ~ 95° F)
	<b>Non-operating Temp.</b>	- 40° C ~ 70° C (-40° F ~ 158° F)
	<b>In/Non-operating Humidity</b>	90%, non-condensing at 35° C
<b>RoHS</b>	<b>RoHS 6/6 Compliant</b>	Yes
<b>Package Contains</b>	<b>Motherboard</b>	(1) S7076 Motherboard
	<b>Manual</b>	(1) Quick Installation Guide
	<b>Installation CD</b>	(1) TYAN installation CD

## 1.3 Software Specifications

For OS (operation system) support, please check with TYAN® support for latest information.

## NOTE

## Chapter 2: Board Installation

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You are now ready to install your motherboard.

### How to install our products right... the first time

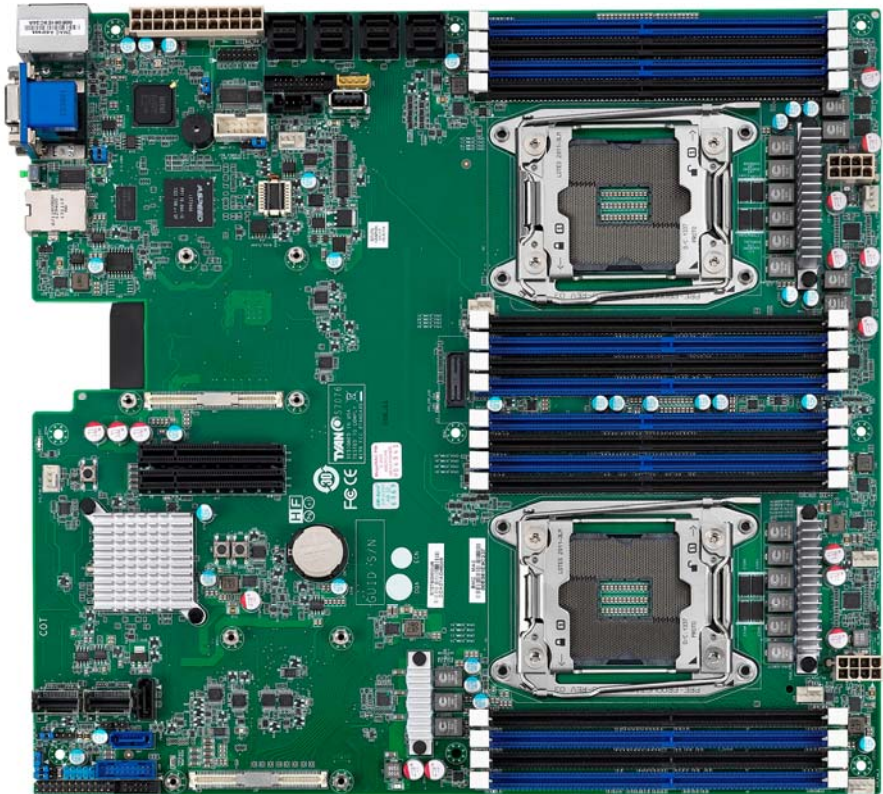
The first thing you should do is reading this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

- (1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, MiTAC recommends wearing a static safety wrist strap.
- (2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
- (3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
- (4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
- (5) Inspect the board for damage.

The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

**NOTE:** Do not apply power to the board if it has been damaged.

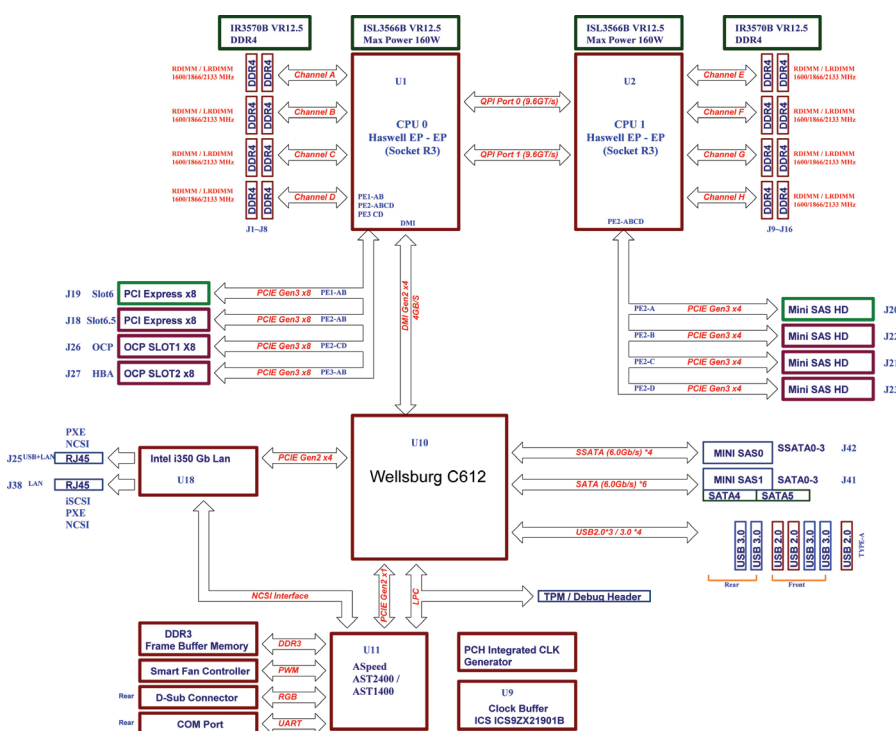
## 2.1 Board Image



**S7076**

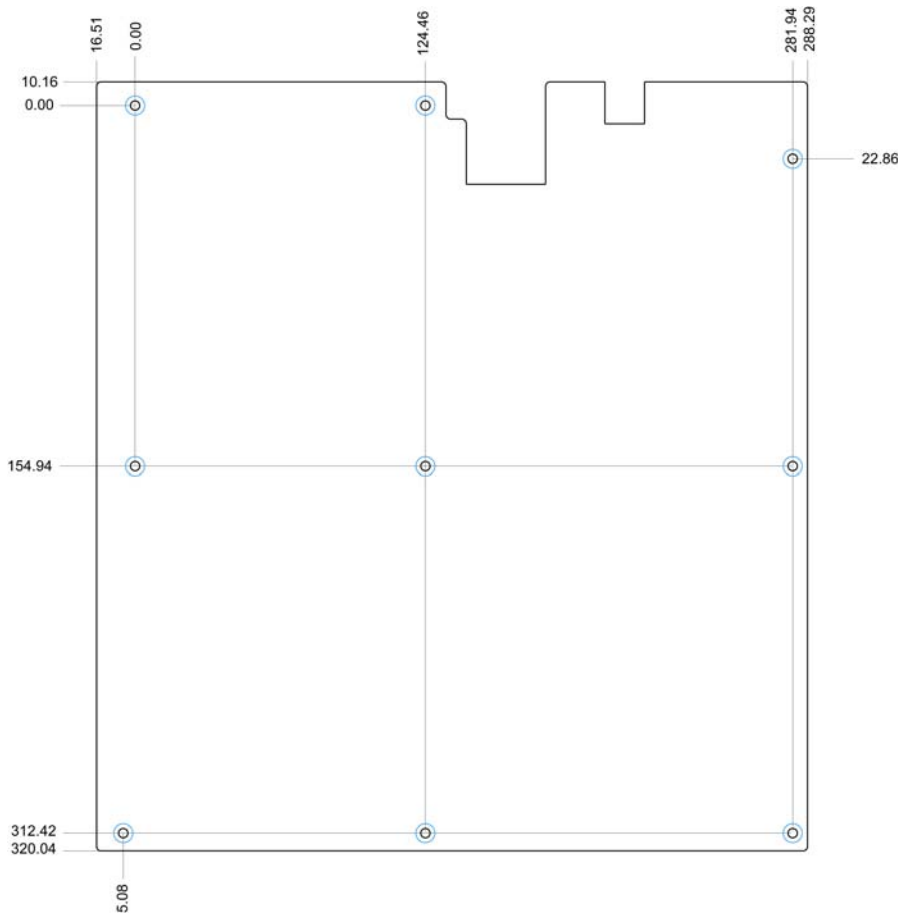
This picture is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above picture.

## 2.2 Block Diagram



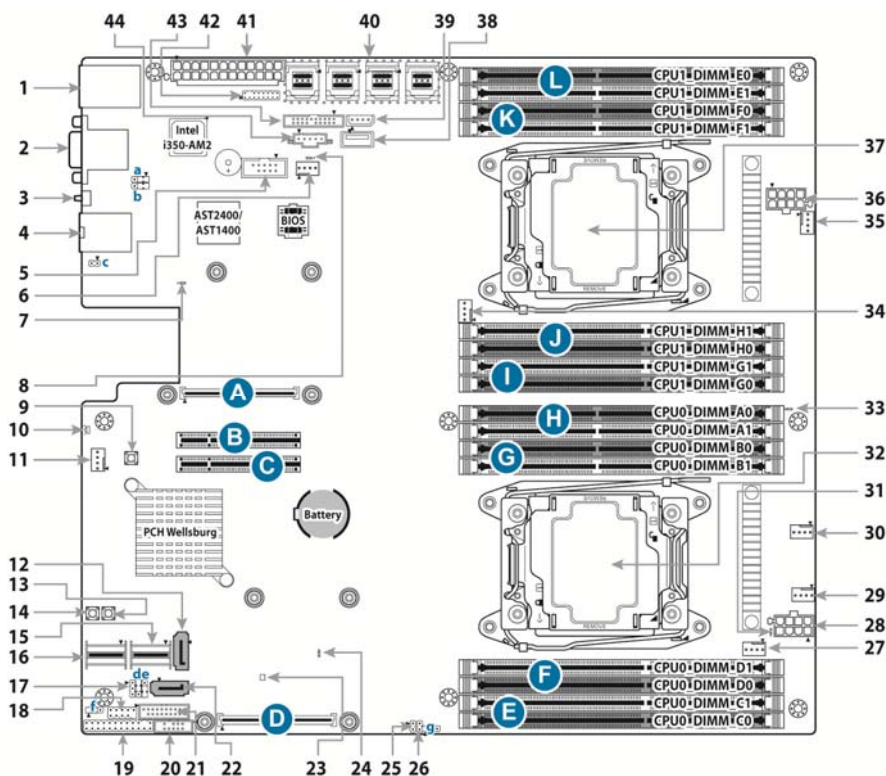
S7076 Block Diagram

## 2.3 Mainboard Mechanical Drawing





## 2.4 Board Parts, Jumpers and Connectors





This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram. But for the DIMM number please refer to the above placement for memory installation. For the latest board revision, please visit our web site at <http://www.tyan.com>.

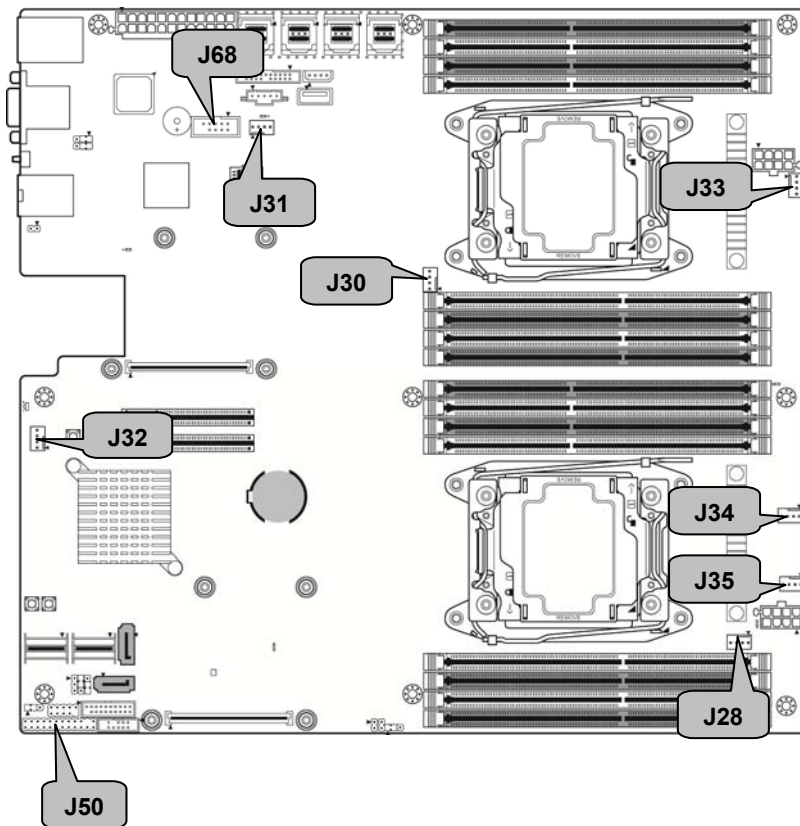
## Jumpers & Connectors

Connector/Jumper	
1 LAN2 + USB 3.0 x 2	23 PCH PWROK LED (LED2)
2 VGA / COM1	24 CAT Error LED (LED3)
3 ID LED Button (SW3)	25 ID LED Button Header (J56)
4 LAN1	26 Chassis Intrusion Header (J57)
5 COM2 Header (J68)	27 CPU0 FAN (J28)
6 SYS_FAN_4 (J31)	28 SSI 8-pin CPU0 Power Connector (PW1)
7 BMC LED (LED1)	29 SYS_FAN_3 (J35)
8 PSU Alert LED (LED10)	30 SYS_FAN_2 (J34)
9 Clear CMOS Button (SW4)	31 CPU0 PWOK LED (LED8)
10 Rear ID LED (LED7)	32 CPU0 Socket (U1)
11 SYS_FAN_5 (J32)	33 CPU1 PWOK LED (LED9)
12 7-pin Vertical SATA3.0 Connector (SATA5, J46)	34 CPU1 FAN (J30)
13 Reset Button (SW2)	35 SYS_FAN_1 (J33)
14 Power Button (SW1)	36 SSI 8-pin CPU1 Power Connector (PW3)
15 SATA0~SATA3 (J41)	37 CPU1 Socket (U2)
16 sSATA0~sSATA3 (J42)	38 Vertical Type-A USB2.0 Connector (J40)
17 HOST SMBUS Header (J61)	39 IPMB Pin Header (J51)
18 USB2.0 Header (J37)	40 Mini-SAS HD Connector (J20/J21/J22/J23)
19 Front Panel Header (J50)	41 ATX 24-pin Main Power Connector (PW2)
20 PCH SATA SGPIO Header for BB HD Board (J43)	42 TYAN Module Header (J48)
21 USB3.0 Header (J36)	43 FAN Header for BB FAN Board (J29)
22 7-pin Vertical SATA3.0 Connector (SATA4, J45)	44 PSMI Pin Header (J49)
Jumpers	Slots
a COM2 or COM5 Selected Jumper (J64)	A OCP Slot for OCP Mezz Card (J26)
b COM2 or COM5 Selected Jumper (J63)	B PCI-E 3.0x8 Slot (x8 link, open-end type, #PCIe-6.5)
c BMC Reset Header (J55)	C PCI-E 3.0x8 Slot (x8 link, open-end type, #PCIe-6)
d BIOS Recovery Mode Jumper (J58)	D Proprietary Slot for SAS Mezz Card (J27)


e NMI Jumper (J67)	E CPU0_DIMM_C0/C1
f ME Recovery Mode Jumper (J62)	F CPU0_DIMM_D0/D1
g ME Security Override Jumper (J60)	G CPU0_DIMM_B0/B1
	H CPU0_DIMM_A0/A1
	I CPU1_DIMM_G0/G1
	J CPU1_DIMM_H0/H1
	K CPU1_DIMM_F0/F1
	L CPU1_DIMM_E0/E1

## Jumper Legend


	<b>OPEN - Jumper OFF</b>	Without jumper cover
	<b>CLOSED - Jumper ON</b>	With jumper cover




## J68: COM Port Header

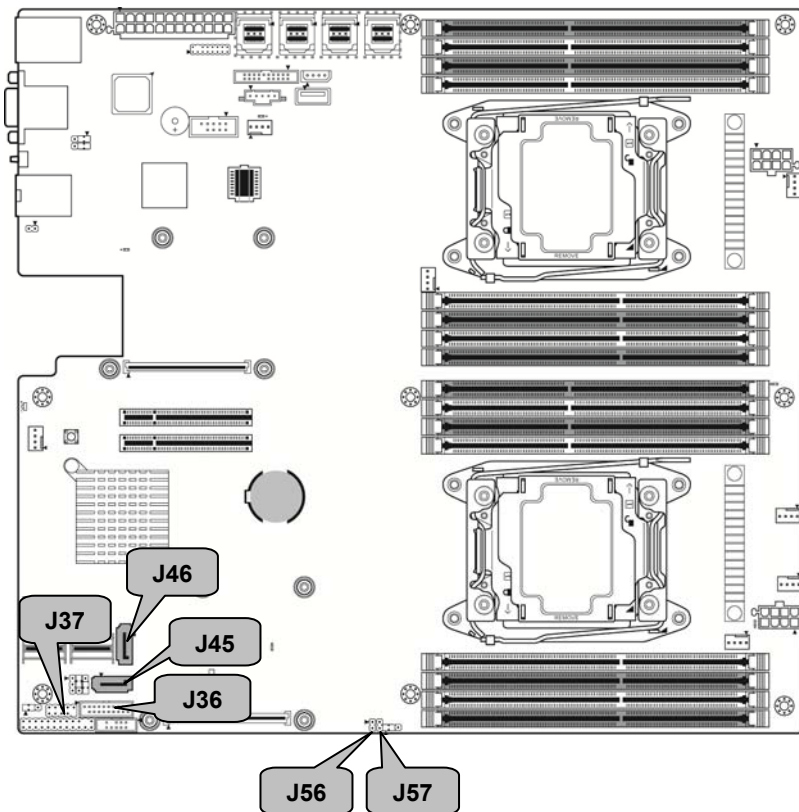
	Signal	Pin	Pin	Signal
	COM2_DCD	1	2	COM2_DSR
	COM2_RXD	3	4	COM2_RTS
	COM2_TXD	5	6	COM2_CTS
	COM2_DTR	7	8	COM2_NRI
	GND	9	10	NC

## J28/J30/J31/J32/J33/J34/J35: 4-pin FAN Connector


	Pin	1	2	3	4
	Signal	GND	VCC12	FAN_TACH	FAN_PWM
Use this header to connect the cooling fan to your motherboard to keep the system stable and reliable.  J28: CPU0 FAN    J30: CPU1 FAN    J31: SYS_FAN_4 J32: SYS_FAN_5    J33: SYS_FAN_1    J34: SYS_FAN_2 J35: SYS_FAN_3					

## J50: Front Panel Header


	Signal	Pin	Pin	Signal
	FP_PW_LED_PW	1	2	FP_PWR
	KEY	3	4	FP_ID_LED_PW
	PWR_LED-	5	6	FP_ID_LED_N
	HDD_LED+	7	8	LED_FAULT1
	HDD_LED-	9	10	LED_FAULT2
	FP_PWRSW#	11	12	LAN0_ACT_P
	GND	13	14	LAN0_LED1_ACT#
	FP_RSTSW#	15	16	FP_SMBDAT
	GND	17	18	FP_SMBCLK
	FP_IDLEDSW#	19	20	FP_INTRUSION#
	NC	21	22	LAN1_ACT_P
	FP_NMISW#	23	24	LAN1_LED1_ACT#



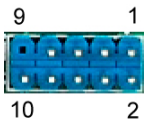
### J56: Front Panel ID LED

PIN1 	Signal	Pin	Pin	Signal
	FP_IDLEDSW#	1	2	GND

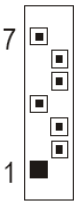
### J57: Chassis Intrusion Header

PIN1 	Signal	Pin	Pin	Signal
	INTRUDER#	1	2	GND


### J37: Front USB2.0 Header (blue)

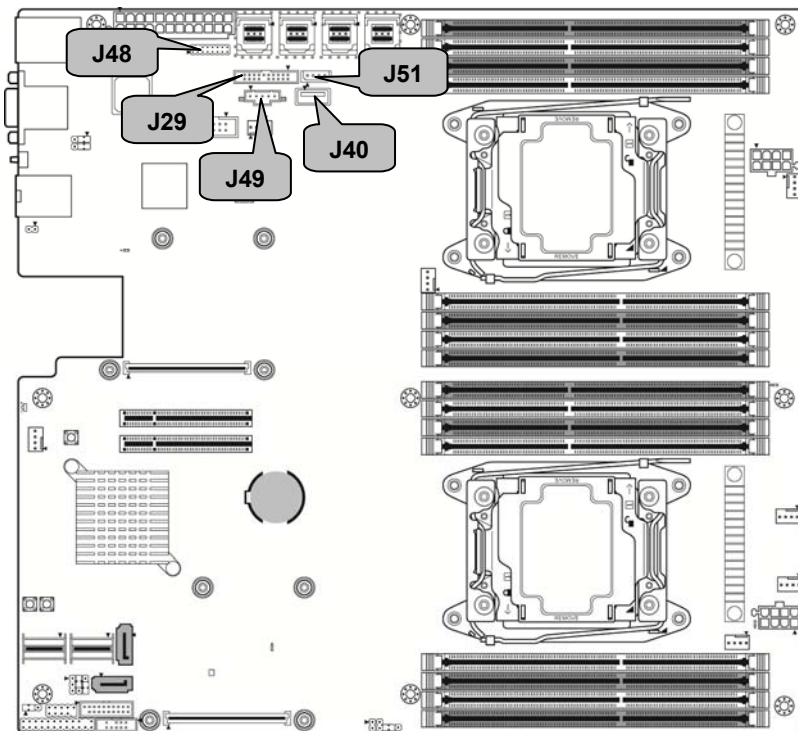
	Signal	Pin	Pin	Signal
	USB2_VCC_REAR_2	1	2	USB2_VCC_REAR_2
	USB2_N3_REAR_3_R	3	4	USB2_N4_REAR_2_R
	USB2_P3_REAR_3_R	5	6	USB2_P4_REAR_2_R
	GND	7	9	GND
	KEY	9	10	OPEN

### J45/J46: 7-pin Vertical SATA3.0 Connector

	PIN Define	Pin	Connects to the Serial ATA ready drives via the Serial ATA cable.  J45: SATA4 J46: SATA5
	1	GND	
	2	SATA_TXP_C	
	3	SATA_TXN_C	
	4	GND	
	5	SATA_RXN_C	
	6	SATA_RXP_C	
	7	GND	


### J36: USB3.0 Header

	Signal	Pin	Pin	Signal
	USB3_VCC_FPB_01	1	20	KEY
	USB3_N5_RX_FPB_N0	2	19	USB3_VCC_FPB_01
	USB3_P5_RX_FPB_P0	3	18	USB3_N6_RX_FPB_N1
	GND	4	17	USB3_P6_RX_FPB_P1
	USB3_N5_TX_FPB_N0	5	16	GND
	USB3_P5_TX_FPB_P0	6	15	USB3_N6_TX_FPB_N1
	GND	7	14	USB3_P6_TX_FPB_P1
	USB2_N12_FPB_N0_R	8	13	GND
	USB2_P12_FPB_P0_R	9	12	USB2_N11_FPB_N1_R
	OC_N	10	11	USB2_P11_FPB_P1_R







## J48: TYAN Module Header

		Signal	Pin	Pin	Signal
		VCC3	1	2	DBG_LFRAME_N
		DBG_LPC0	3	4	KEY
		DBG_LPC1	5	6	TPM_RST#
		DBG_LPC2	7	8	GND
		DBG_LPC3	9	10	CLK_33M_TPM
		DBG_SERIRQ	11	12	GND
		DBG_PRESEN	13	14	VCC3_AUX
		TPM_ADDR_MB	15	16	PCH_TPM_PP_EN


## J40: Vertical Type-A USB Connector

		Signal	Pin	Pin	Signal
		USB_VCC_TYPE_A	1	2	USB_N2_TYPE_A1_R
		USB_P2_TYPE_A1_R	3	4	GND


## J49: PSMI Connector

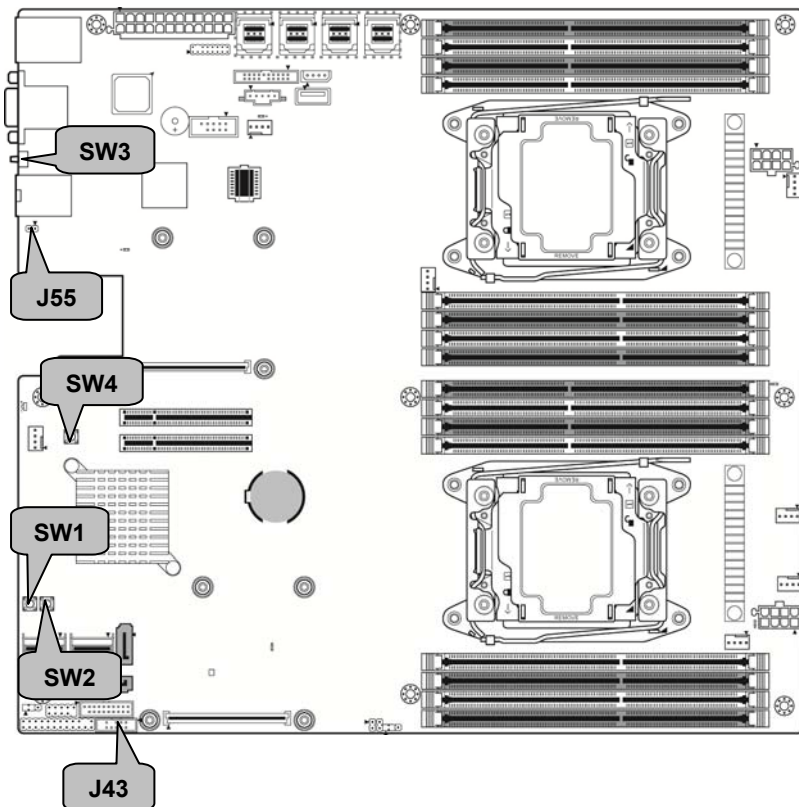
		Signal	Pin	Pin	Signal
		PSMI_5V_SMBCLK	1	2	PSMI_5V_SMBDATA
		PSU_ALERT_N	3	4	GND
		VCC3	5		

## J51: IPMB Pin Header


		Pin	1	2	3	4
		Signal	IPMB DATA	GND	IPMB CLK	VCC

## J29: Fan Connector Reserved for Barebone


		Signal	Pin	Pin	Signal
		FAN_T1	1	2	FAN_T6
		FAN_T2	3	4	FAN_T7
		FAN_T3	5	6	FAN_T8
		FAN_T4	7	8	FAN_T9
		FAN_T5	9	10	FAN_T10
		GND	11	12	KEY
		PWM_REAR12	13	14	PWM_FRONT3
		FAN_T11	15	16	FAN_SDA
		FAN_T12	17	18	FAN_SCK
		VCC3_AUX	19	20	PWM_BB3




### J43: PCH SGPIO Pin Header

	Signal	Pin	Pin	Signal
	SATA4_5_SM_CLK	1	2	NC
	SATA4_5_SM_DAT	3	4	SGPIO_SATA_DATAOUT0_R2
	GND	5	6	SGPIO_SATA_LOAD_R2
	KEY	7	8	SGPIO_SATA_CLK_R2
	VCC3_AUX	9	10	SATA_ERR_P


### J55: BMC Reset Header

	Signal	Pin	Pin	Signal
	BMC_JP_N	1	2	GND


### SW3 (J56): ID LED Switch Button

	Signal	Pin	Pin	Signal
	FP_IDLED_BTN_N	1	2	GND
	GND	3	4	GND


### SW1: Power Switch Button

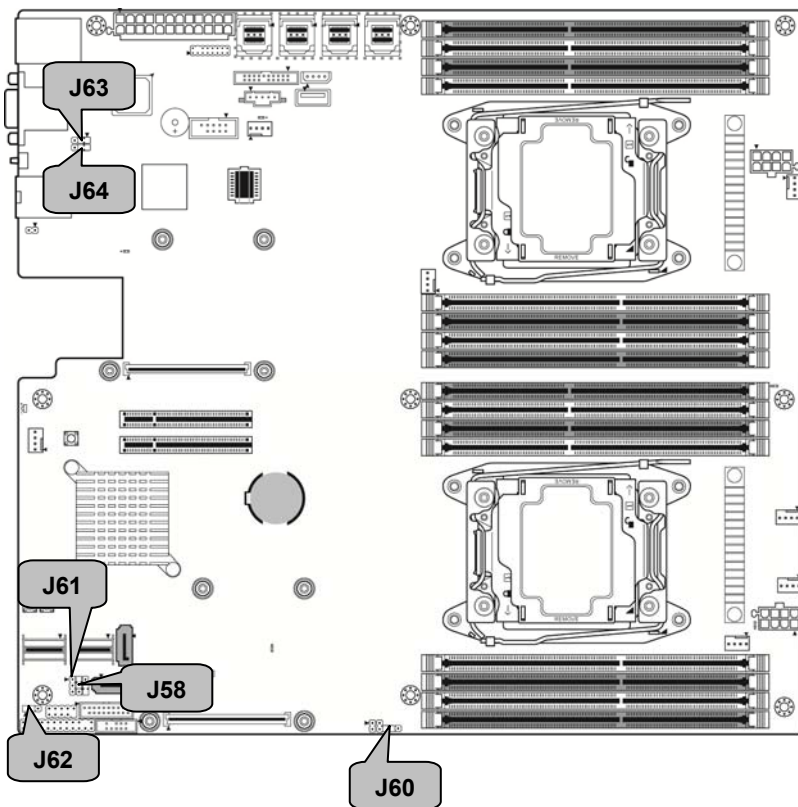
 <p>Normal (Default)</p>	Signal	Pin	Pin	Signal
	FP_PWR_BTN_N	1	2	FP_PWR_BTN_N
	GND	3	4	GND

### SW2: Reset Switch Button


 <p>Normal (Default)</p>	Signal	Pin	Pin	Signal
	FP_RST_BTN_N	1	2	FP_RST_BTN_N
	GND	3	4	GND

### SW4: Clear CMOS Reset Button

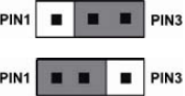
 <p>Normal (Default)</p>	<p>You can reset the CMOS settings by using this button, if you have forgotten your system/setup password or need to clear system BIOS setting.</p> <ol style="list-style-type: none"> <li>1. Power off the system and disconnect power connectors from the motherboard.</li> <li>2. Press the button (Clear CMOS).</li> <li>3. Reconnect power &amp; power on the system.</li> </ol> <p><b>NOTE:</b> After flashing new BIOS, do the following steps:</p> <ol style="list-style-type: none"> <li>a. Clear CMOS</li> <li>b. Enter BIOS setup menu and load Default Settings. Then do a Save and Exit from setup.</li> </ol>			



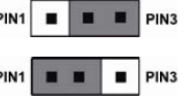
## J61: HOST SMB Header

	Signal	Pin	Pin	Signal
	PCH_HOST_3V3STBY_SMB_DAT	1	2	GND
	PCH_HOST_3V3STBY_SMB_CLK	3		

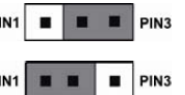
## J58: BIOS Recovery Mode Jumper

	Pin	1	2	3
	Signal	OPEN	BIOS_RCVR_BOOT_N	GND
	Pin1-2 closed: Normal <b>(Default)</b> Pin2-3 closed: BIOS Recovery Mode			

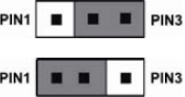
## J63: COM2 or COM5 Selected Jumper

	Pin	1	2	3
	Signal	BMC_COM2_RXD	RXD_2	BMC_COM5_RXD
	Pin1-2 closed: COM2 <b>(Default)</b> Pin2-3 closed: COM5			

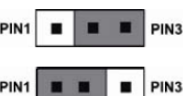
## J64: COM2 or COM5 Selected Jumper

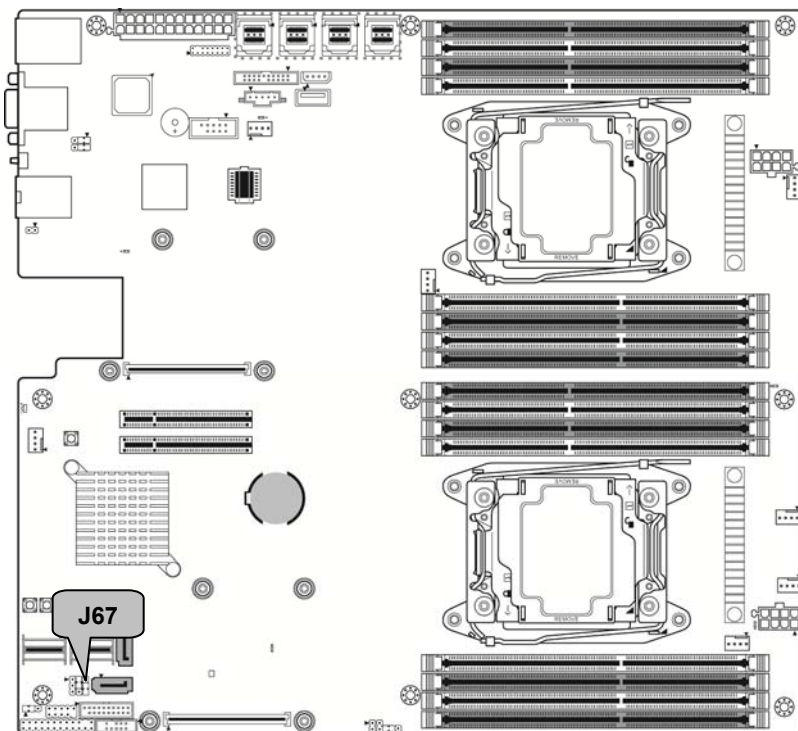
	Pin	1	2	3
	Signal	BMC_COM2_TXD	TXD_2	BMC_COM5_TXD
	Pin1-2 closed: COM2 <b>(Default)</b> Pin2-3 closed: COM5			

## J62: ME Firmware Recovery Mode Jumper

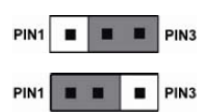
	Pin	1	2	3
	Signal	OPEN	FM_ME_RCVR_N	GND
	Pin1-2 closed: Normal <b>(Default)</b> Pin2-3 closed: ME Firmware Recovery Mode			

## J60: Flash Descriptor Security Override Header

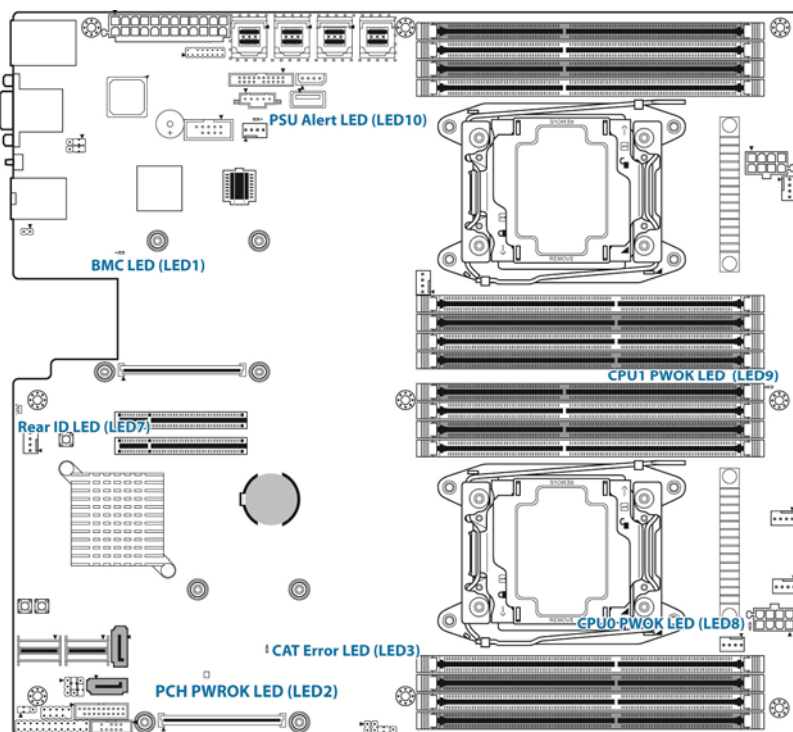
	Pin	1	2	3
	Signal	OPEN	MFG_MODE_N	GND
	Pin1-2 closed: Enable security measures defined in the Flash Descriptor-Normal <b>(Default)</b> Pin2-3 closed: Disable Flash Descriptor Security (override)			



## J67: NMI Jumper

 PIN1 ■ ■ ■ PIN3 PIN1 ■ ■ ■ PIN3	Signal	Pin	Pin	Signal
	FP_NMI_BTN_N	1	2	FP_PIN23_N
	FP_HD_FAULT_LED	3		
	Pin1-2 closed: Normal <b>(Default)</b> Pin2-3 closed: Remove NMI Button Function			

## 2.5 LED Definitions





LED1	BMC Heart Beat LED	<b>Pin</b>	<b>Signal</b>	
		+	+3V_AUX	
		-	GND	
		<b>State</b>	<b>Description</b>	
		OFF	OFF	The LED shuts off when the BMC controller cannot be detected or properly initiated.
LED2	PCH PWOK LED	Blinking	Green	The LED blinks per second to indicate that the BMC controller is working normally
		<b>Pin</b>	<b>Signal</b>	
		+	+3V	
		-	GND	
		<b>State</b>	<b>Description</b>	
LED3	CAT Error LED	OFF	OFF	The LED shuts off when the power of PCH is abnormal.
		ON	Amber	The amber LED lights up when the power of PCH is normal.
		<b>Pin</b>	<b>Signal</b>	
		+	+3V	
		-	GND	
LED7	Rear ID LED	<b>State</b>	<b>Description</b>	
		OFF	OFF	The LED shuts off when System is running normally.
		ON	Red	The LED lighted up when the system has experienced a fatal or catastrophic error and can not continue to operate.
		<b>Pin</b>	<b>Signal</b>	
		+	+ VCC3_AUX	
LED8	CPU0 PWOK LED	-	GND	
		<b>State</b>	<b>Description</b>	
		OFF	OFF	OFF
		ON	Green	ON
		<b>Pin</b>	<b>Signal</b>	
LED8	CPU0 PWOK LED	+	+3V	
		-	GND	
		<b>State</b>	<b>Description</b>	
		OFF	OFF	OFF
		ON	Green	ON

LED9	CPU1 PWOK LED	<b>Pin</b>	<b>Signal</b>	
		+	+ 3V	
		-	GND	
		<b>State</b>	<b>Description</b>	
		OFF	OFF	The LED shuts off when the power of CPU1 is abnormal.
LED10	PSU Alert LED	ON	Green	The LED lights up when the power of CPU1 is normally.
		<b>Pin</b>	<b>Signal</b>	
		+	+ VCC3_AUX	
		-	GND	
		<b>State</b>	<b>Description</b>	
		OFF	OFF	The LED shuts off when the PSU is normal.
		ON	Green	The LED lights up when the PSU is abnormally.

## 2.6 Installing the Processor and Heat sink

The S7076 supported Intel® processors are listed in section **1.2 Hardware Specifications** on page 5. Check our website at <http://www.tyan.com> for latest processor support.

**NOTE:** MiTAC TYAN is not liable for damage as a result of operating an unsupported configuration.

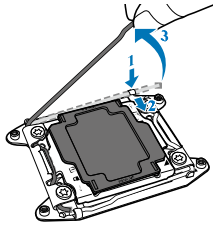
### **Processor Installation for Socket-R3 (LGA2011)**

Follow the steps below to install the processors and heat sinks.

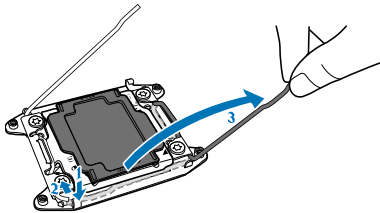
Please note that the illustrations are based on a Socket-R3 (LGA2011) which may not look exactly like the motherboard you purchased. Therefore, the illustrations should be held for your reference only.

**NOTE:** Please save and replace the CPU protection cap when returning for service.

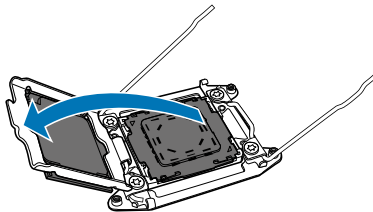
1. Open the socket levers.



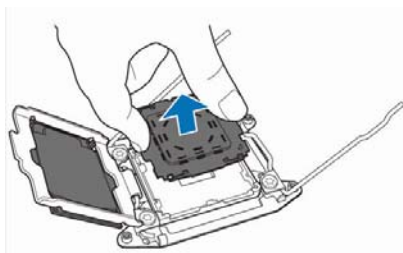
2. Open the other socket lever.



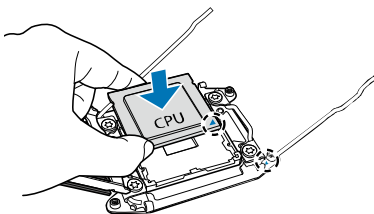
3. Open the CPU socket cover.



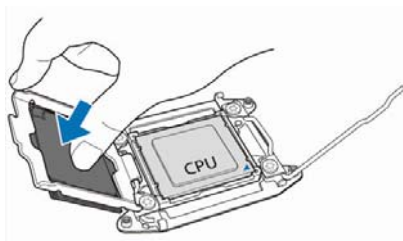
4. Remove the CPU protection cap.



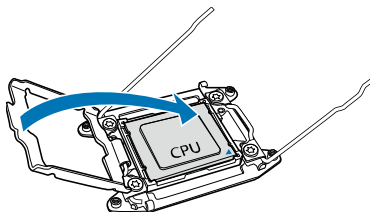
5. Install the processor and make sure the gold arrow is located in the right direction.



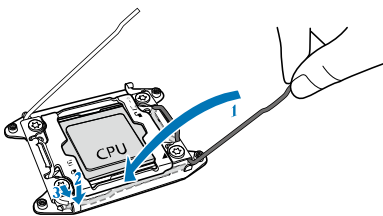
6. Remove the other CPU protection cap attached on the socket cover.



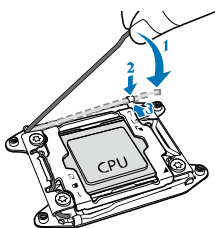
7. Close the CPU socket cover.



8. Close the socket levers.



9. Close the other socket lever.



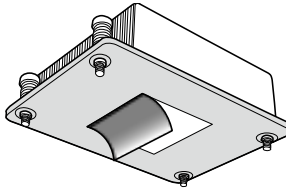
## **Heat sink Installation**

After installing the processor, you should proceed to install the heat sink. The CPU heat sink will ensure that the processor do not overheat and continue to operate at maximum performance for as long as you own them. The overheated processor is dangerous to the motherboard.

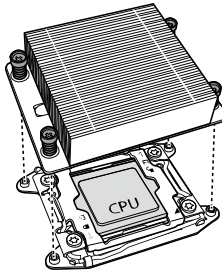
For the safest method of installation and information on choosing the appropriate heat sink, using heat sinks validated by Intel®. Please refer to the Intel® website: <http://www.intel.com>

The following diagram illustrates how to install the heat sink for the S7076.

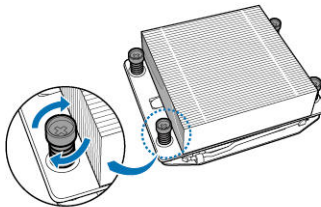
1. Remove the protective sheet..



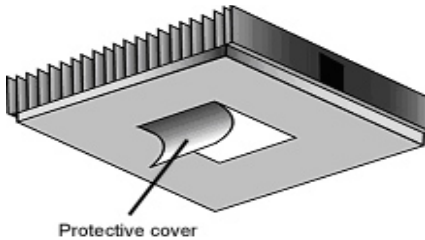
2. Install the CPU heatsink.



3. Secure the heat sink screws.

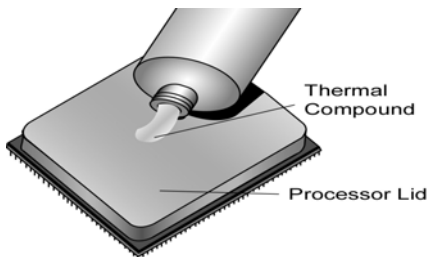


## 2.7 Thermal Interface Material



There are two types of thermal interface materials designed for use with the processors.

The most common material comes as a small pad attached to the heat sink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material. Simply remove the protective cover and place the heat sink on the processor.

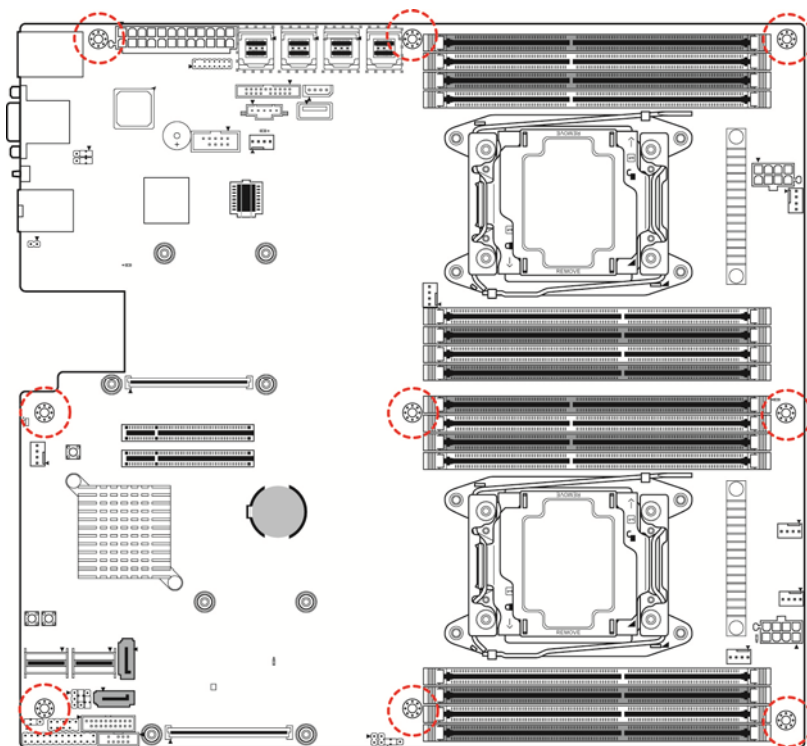


The second type of interface material is usually packaged separately. It is commonly referred to as 'thermal compound'. Simply apply a thin layer on to the CPU lid (applying too much will actually reduce the cooling).

**NOTE:** Always check with the manufacturer of the heat sink & processor to ensure that the thermal interface material is compatible with the processor and meets the manufacturer's warranty requirements.

## 2.8 Tips on Installing Motherboard in Chassis

Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.

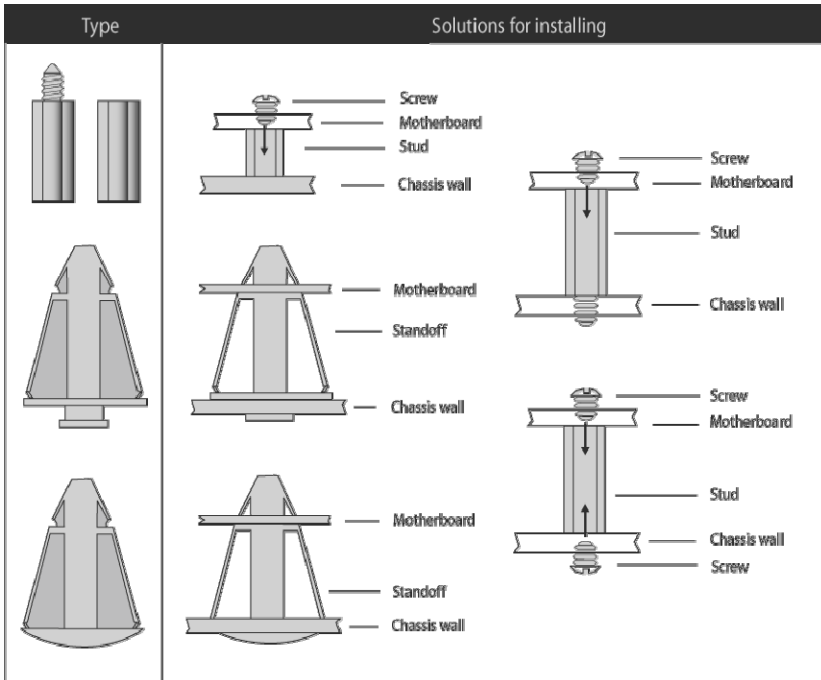


Some chassis include plastic studs instead of metal. Although the plastic studs are usable, MiTAC recommends using metal studs with screws that will fasten the motherboard more securely in place.

Below is a chart detailing what the most common motherboard studs look like and how they should be installed.



## Mounting the Motherboard

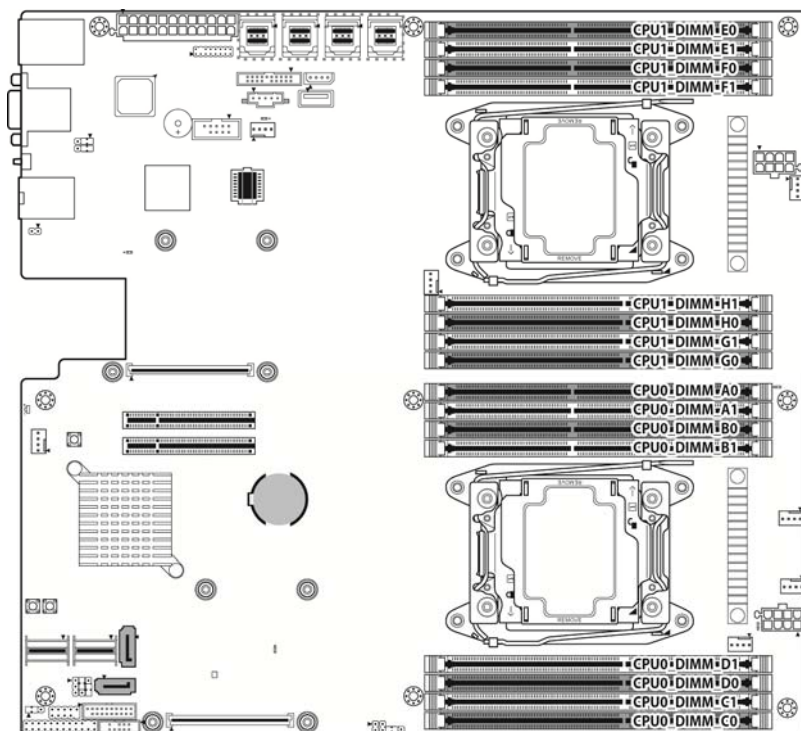


## 2.9 Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. Check the TYAN Web site at <http://www.tyan.com> for details of the type of memory recommended for your motherboard.

- Supports eight (4+4) 284-Pin DDR4 sockets, up to 2048GB LRDIMM 3DS/ 1024GB LRDIMM/ 512GB RDIMM
- Supports single/dual rank memory
- All installed memory will automatically be detected and no jumpers or settings need changing
- All memory must be of the **same type and density**

### DIMM Location



## DDR4 Memory POR for Haswell-EP

Type	Ranks Per DIMM and Data Width	DIMM Capacity ( GB)		Speed (MT/s); Voltage (V); Slot Per Channel (SPC) and DIMM Per Channel (DPC)					
				1 Slot Per Channel	2 Slots Per Channel		3 Slots Per Channel		
		4 GB	8 GB	1 DPC	1 DPC	2 DPC	1 DPC	2 DPC	3 DPC
				1.2V	1.2V	1.2V	1.2V	1.2V	1.2V
RDIMM	SRx4	8 GB	16 GB	2133	2133	1866	2133	1866	1600
RDIMM	SRx8	4 GB	8 GB	2133	2133	1866	2133	1866	1600
RDIMM	DRx8	8 GB	16 GB	2133	2133	1866	2133	1866	1600
RDIMM	DRx4	16 GB	32 GB	2133	2133	1866	2133	1866	1600
LRDIMM	QRx4	32 GB	64 GB	2133	2133	2133	2133	2133	1600
LRDIMM 3DS†	8Rx4	64 GB	128 GB	2133	2133	2133	2133	2133	1600

† Grantley intercept at platform refresh (Broadwell)

### S7076 Recommended Memory Population Table

Quantity of memory installed	Single CPU Installed (CPU0 only)					
	1	2	3	4	6	8
CPU0_DIMM_A0	√	√	√	√	√	√
CPU0_DIMM_A1					√	√
CPU0_DIMM_B0		√	√	√	√	√
CPU0_DIMM_B1					√	√
CPU0_DIMM_C0				√	√	√
CPU0_DIMM_C1						√
CPU0_DIMM_D0			√	√	√	√
CPU0_DIMM_D1						√

#### NOTE:

1. √ indicates a populated DIMM slot.
2. Use paired memory installation for max performance.
3. Populate the same DIMM type in each channel, specifically
  - Use the same DIMM size
  - Use the same # of ranks per DIMM

	Dual CPU installed (CPU0 and CPU1)									
Quantity of memory installed	2	3	4	5	6	7	8	10	12	16
CPU0_DIMM_A0	√	√	√	√	√	√	√	√	√	√
CPU0_DIMM_A1								√	√	√
CPU0_DIMM_B0		√	√	√	√	√	√	√	√	√
CPU0_DIMM_B1									√	√
CPU0_DIMM_C0							√	√	√	√
CPU0_DIMM_C1										√
CPU0_DIMM_D0				√	√	√	√	√	√	√
CPU0_DIMM_D1										√
CPU1_DIMM_E0	√	√	√	√	√	√	√	√	√	√
CPU1_DIMM_E1								√	√	√
CPU1_DIMM_F0					√	√	√	√	√	√
CPU1_DIMM_F1										√
CPU1_DIMM_G0			√	√	√	√	√	√	√	√
CPU1_DIMM_G1									√	√
CPU1_DIMM_H0						√	√	√	√	√
CPU1_DIMM_H1										√

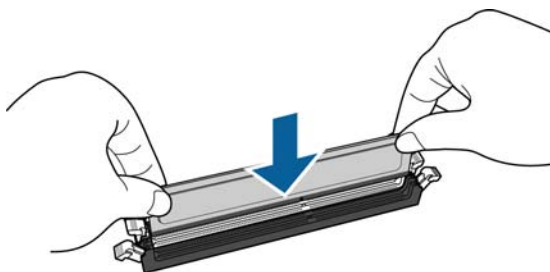
## Memory Installation Procedure

Follow these instructions to install memory modules into the S7076.

1. Unlock the clips as shown in the illustration.



2. Insert the memory module firmly into the socket by gently pressing down until it sits flush with the socket.



3. Lock the clips to secure the memory module into place.



## 2.10 Attaching Drive Cables

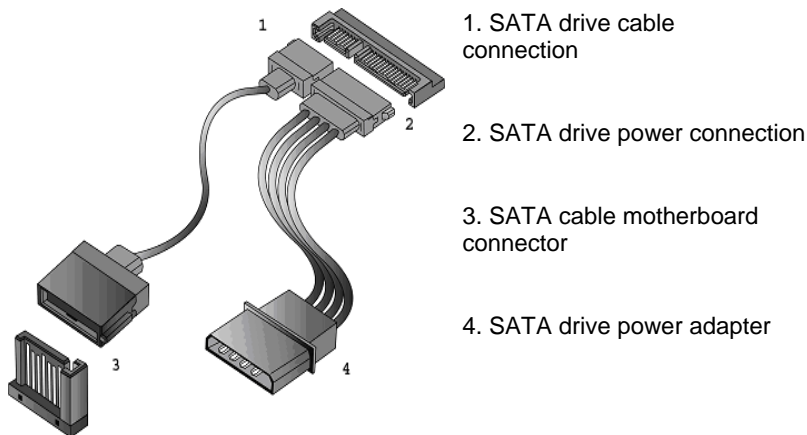
### Attaching Serial ATA Cables

S7076 is equipped with **six (6)** Serial ATA (SATA) channel. Connections for the drives are very simple.

There is no need to set Master/Slave jumpers on SATA drives.

If you are in need of SATA/SAS cables or power adapters please contact your place of purchase.

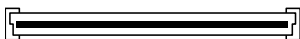
The following pictures illustrate how to connect an SATA drive.



## 2.11 Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the slots that may appear on your motherboard.

### OCP slot for OCP Mezz card (J26)



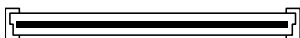
### PCI-E 3.0x8 slot(x8link, open-end type) (#PCIe-6.5) (J18)



### PCI-E 3.0x8 slot(x8link, open-end type) (#PCIe-6) (J19)



### Proprietary slot for SAS Mezz card (J27)



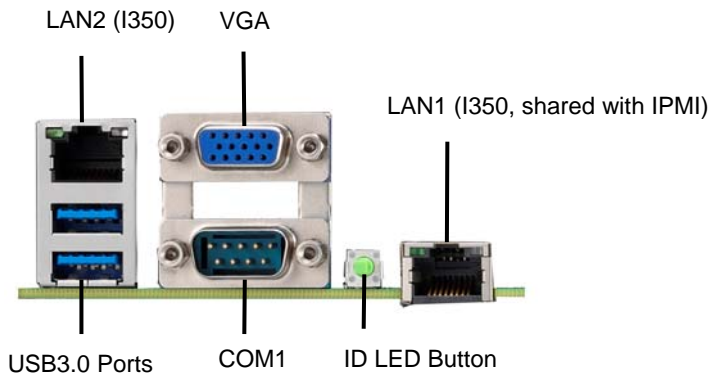
Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

**TIP:** It's a good practice to install add-in cards in a staggered manner rather than making them directly adjacent to each other. Doing so allows air to circulate within the chassis more easily, thus improving cooling for all installed devices.

**NOTE:** You must always unplug the power connector to the motherboard before performing system hardware changes to avoid damaging the board or expansion device.

## 2.12 Connecting External Devices


Connecting external devices to the motherboard is an easy task. The motherboard supports a number of different interfaces through connecting peripherals. See the following diagrams for the details.



**NOTE:** Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.

### Onboard LAN LED Color Definition

The **two (2)** onboard Ethernet ports have green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.


10/100/1000 Mbps LAN Link/Activity LED Scheme			
<div>LEFT      RIGHT</div> 		Left LED	Right LED
10 Mbps	Link	Green	Off
	Active	Blinking Green	Off
100 Mbps	Link	Green	Solid Green
	Active	Blinking Green	Solid Green
1000 Mbps	Link	Green	Solid Yellow
	Active	Blinking Green	Solid Yellow
No Link		Off	Off




## 2.13 Installing the Power Supply

There are **three (3)** power connectors on your S7076 motherboard. The S7076 supports EPS 12V power supply.


### PW2: ATX 24-pin Main Power Connector

	Signal	Pin	Pin	Signal
	VCC3	1	13	VCC3
	VCC3	2	14	-12V
	GND	3	15	GND
	VCC5	4	16	PS_ON#
	GND	5	17	GND
	5V	6	18	GND
	GND	7	19	GND
	PWR_OK	8	20	RES
	5VSB	9	21	VCC5
	VCC12	10	22	VCC5
	VCC12	11	23	VCC5
	VCC3	12	24	GND

### PW1: SSI 8-pin CPU0 Power Connector

	Signal	Pin	Pin	Signal
	GND	1	5	P0_P12V
	GND	2	6	P0_P12V
	GND	3	7	P0_MEM_P12V
	GND	4	8	P0_MEM_P12V

### PW3: SSI 8-pin CPU1 Power Connector

	Signal	Pin	Pin	Signal
	GND	1	5	P1_P12V
	GND	2	6	P1_P12V
	GND	3	7	P1_MEM_P12V
	GND	4	8	P1_MEM_P12V

#### NOTE:

1. You must unplug the power supply before plugging the power cables to motherboard connectors.
2. Apply 5Vsb power supply with current support below 2A.

## 2.14 Finishing Up

Congratulations on making it this far! You have finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially IDE cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.

In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by calling your vendor's support line.

## Chapter 3: BIOS Setup

---

### 3.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print and are subject to change, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information even when the power is turned off.

#### To start the BIOS setup utility:

1. Turn on or reboot your system.
2. Press <Del> or <F2> during POST (**Del** on remote console) to start the BIOS setup utility.

#### 3.1.1 Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

Key	Function
Left/Right Arrow Keys	Change from one menu to the next
Up/Down Arrow Keys	Move between selections
Enter	Open highlighted section
PgUp/PgDn Keys	Change pages
+/-	Change options
ESC	Exit

### 3.1.2 Getting Help

Pressing [**F1**] will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [**ESC**] or the [**Enter**] key again.

### 3.1.3 In Case of Problems

If you have trouble booting your computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.

The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of what you are doing. The Chipset defaults have been carefully chosen either by MiTAC or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

### 3.1.4 Setup Variations

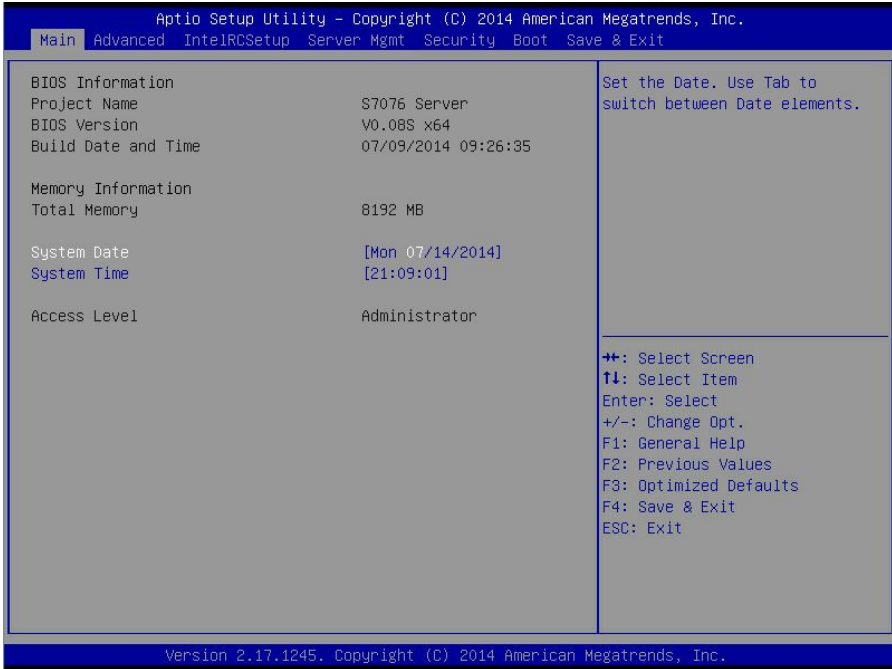
Not all systems have the same BIOS setup layout or options. While the basic look and function of the BIOS setup remains more or less the same for most systems, the appearance of your Setup screen may differ from the charts shown in this section. Each system design and chipset combination requires a custom configuration. In addition, the final appearance of the Setup program depends on the system designer. Your system designer may decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

**NOTE:** The following pages provide the details of BIOS menu. Please be noticed that the BIOS menu are continually changing due to the BIOS updating. The BIOS menu provided are the most updated ones when this manual is written. Please visit TYAN's website at <http://www.tyan.com> for the information of BIOS updating.

## 3.2 Main Menu

In this section, you can alter general features such as the date and time.

Note that the options listed below are for options that can directly be changed within the Main Setup screen.



### BIOS Information

It displays BIOS related information.

### Memory Information

This displays the total memory size.

### System Date

Adjust the system date.

MM (Months): DD (Days): YYYY (Years)

### System Time

Adjust the system clock.

HH (24 hours format): MM (Minutes): SS (Seconds)

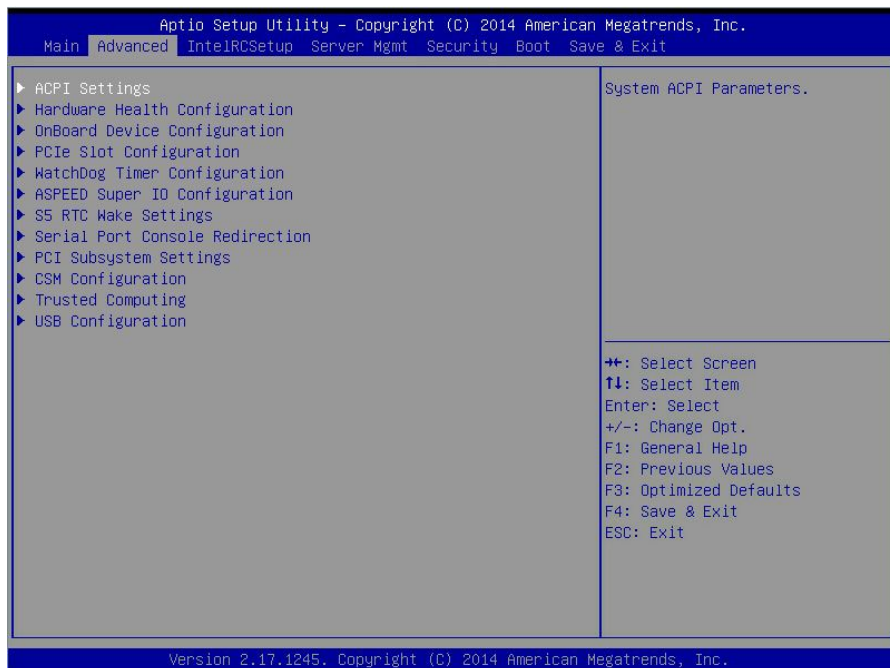
### Access Level

Read only.

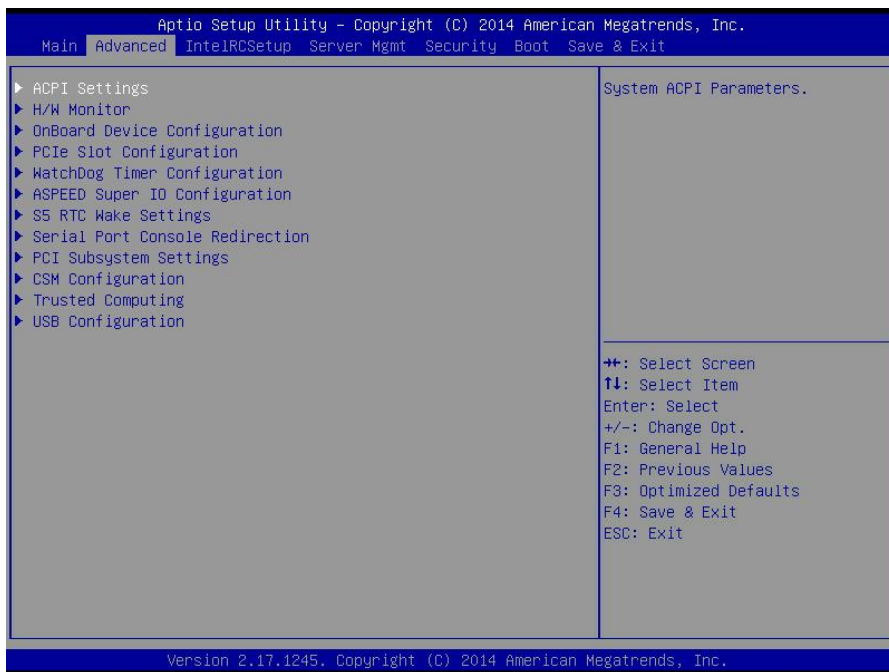
### 3.3 Advanced Menu

This section facilitates configuring advanced BIOS options for your system.

#### S7076GM2NR (AST2400)



## S7076G2NR-AKA (AST1400)



### ACPI Settings

System ACPI Parameters.

### Hardware Health Configuration / H/W Monitor

Hardware health Configuration Parameters.

### Onboard Device Configuration

Onboard Device Configuration.

### PCIe Slot Configuration

Onboard PCIe Slot Configuration.

### WatchDog Timer Configuration

WatchDog Configuration.

### ASPEED Super IO Configuration

System Super IO Chip Parameters.

### S5 RTC Wake Settings

Enable system to wake from S5 using RTC alarm.

**Serial Port Console Redirection**

Serial Port Console Redirection.

**PCI Subsystem Settings**

PCI, PCI-X and PCI Express Settings.

**CSM Configuration**

CSM configuration: Enable/Disable, Option ROM execution settings, etc.

**Trusted Computing**

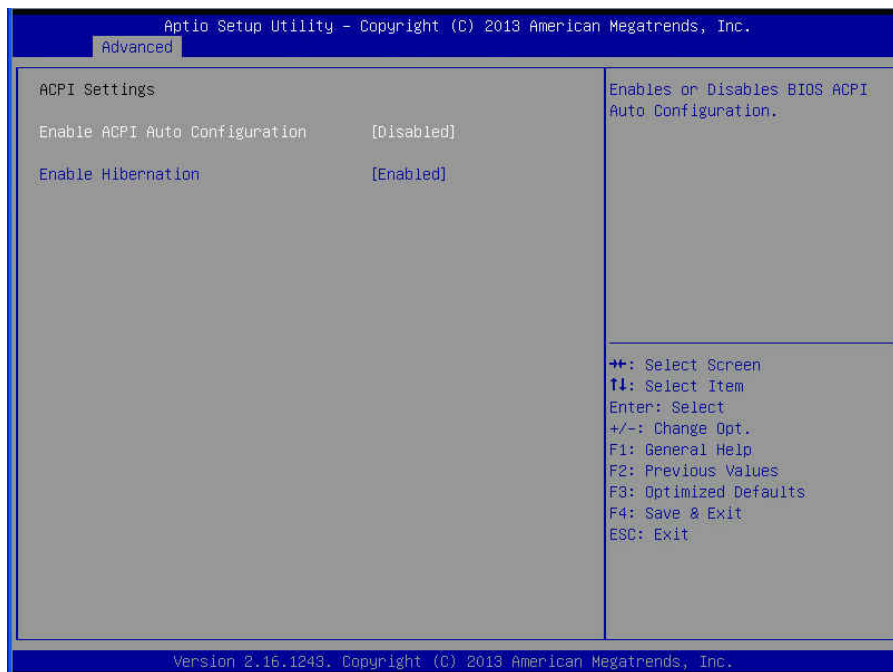
Trusted Computing Settings.

**USB Configuration**

USB Configuration Parameters.



### 3.3.1 ACPI Settings



#### **Enable ACPI Auto Configuration**

Enables or Disables BIOS ACPI Auto Configuration.

**Disabled** / Enabled

#### **Enable Hibernation**

Enable or disable System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

Disabled / **Enabled**

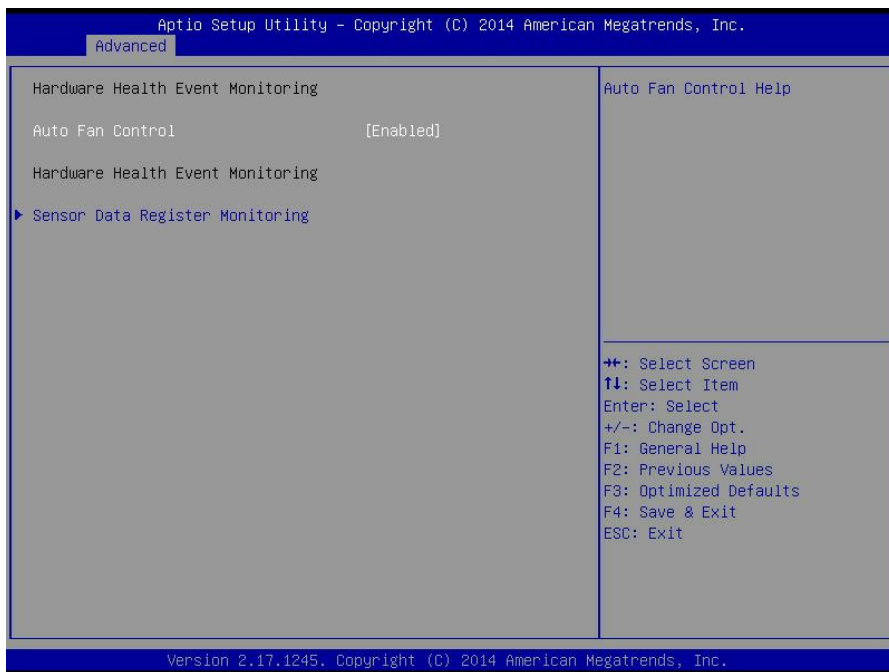
### 3.3.2 Hardware Health Configuration / H/W Monitor

#### S7076GM2NR (AST2400)

Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.	
Advanced	
Hardware Health Event Monitoring	Auto Fan Control Help
Auto Fan Control [Enabled]	
PWM Minimal Duty Cycle [30% Duty Cycle]	
BMC Alert Beep [On]	
PSU Status Monitor	
PMBus Support [Disabled]	
Hardware Health Event Monitoring	
► Sensor Data Register Monitoring	
	⬅➡: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Version 2.17.1245. Copyright (C) 2014 American Megatrends, Inc.

## S7076G2NR-AKA (AST1400)



### Auto Fan Control

Auto Fan Control Help.

**Enabled** / Disabled

**NOTE:** **PWM Minimal Duty Cycle** will appear when **Auto Fan Control** is set to [Enabled].

### PWM Minimal Duty Cycle

PWM Minimal Duty Cycle.

**30% Duty Cycle** / 45% Duty Cycle / 60% Duty Cycle

### BMC Alert Beep

Enable/Disable BMC Alert Beep.

**On** / Off

### PM Bus Support

PM Bus support.

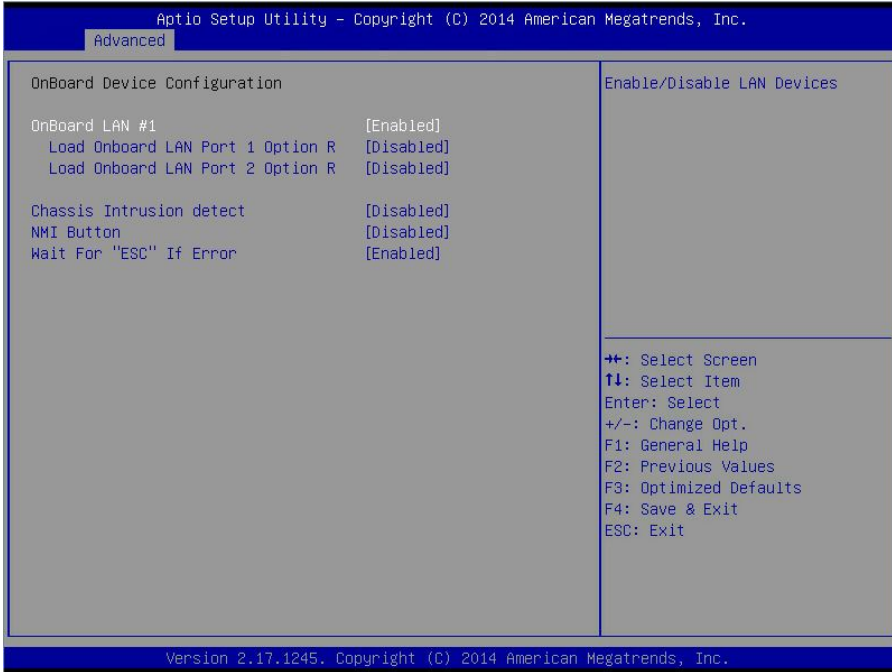
**Disabled** / Enabled

### 3.3.2.1 Sensor Data Register Monitoring

Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.				
Advanced				
PC Health Status				
ID#	NAME	READING	UNIT	STATUS
01	CPU0_DTS_Temp	: 81	°C	OK
02	CPU1_DTS_Temp	: 43	°C	OK
03	CPU0_PECI_Value	: -10		OK
04	CPU1_PECI_Value	: -48		OK
0A	PCH_Temp	: 36	°C	OK
41	CPU0_DIMM_A0	: N/A	°C	OK
42	CPU0_DIMM_A1	: N/A	°C	OK
44	CPU0_DIMM_B0	: N/A	°C	OK
45	CPU0_DIMM_B1	: N/A	°C	OK
47	CPU0_DIMM_C0	: N/A	°C	OK
48	CPU0_DIMM_C1	: N/A	°C	OK
4A	CPU0_DIMM_D0	: N/A	°C	OK
4B	CPU0_DIMM_D1	: N/A	°C	OK
4D	CPU1_DIMM_A0	: N/A	°C	OK
4E	CPU1_DIMM_A1	: N/A	°C	OK
50	CPU1_DIMM_B0	: N/A	°C	OK
51	CPU1_DIMM_B1	: N/A	°C	OK
53	CPU1_DIMM_C0	: N/A	°C	OK
54	CPU1_DIMM_C1	: N/A	°C	OK
56	CPU1_DIMM_D0	: N/A	°C	OK
57	CPU1_DIMM_D1	: N/A	°C	OK
10	PVCCP_CPU0	: 1.8326	V	OK
++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit				
Version 2.17.1245. Copyright (C) 2014 American Megatrends, Inc.				

Read only.

### 3.3.3 Onboard Device Configuration



**NOTE:** The BIOS will automatically read the onboard LAN controller.

#### Onboard LAN#1

Enable/Disable Onboard Network Controller.

**Enabled** / Disabled

#### Load Onboard LAN 1 Option ROM

Enable/Disable Load Option ROM for OnBoard Network Controller.

**Disabled** / Enabled with PXE

#### Load Onboard LAN 2 Option ROM

Enable/Disable Load Option ROM for OnBoard Network Controller.

**Disabled** / Enabled with PXE / Enabled with iSCSI

#### Chassis Intrusion detect

Enabled: When a chassis open event is detected, the BIOS will record the event.

**Disabled** / Enabled

#### NMI Button

Enable or Disable NMI button.

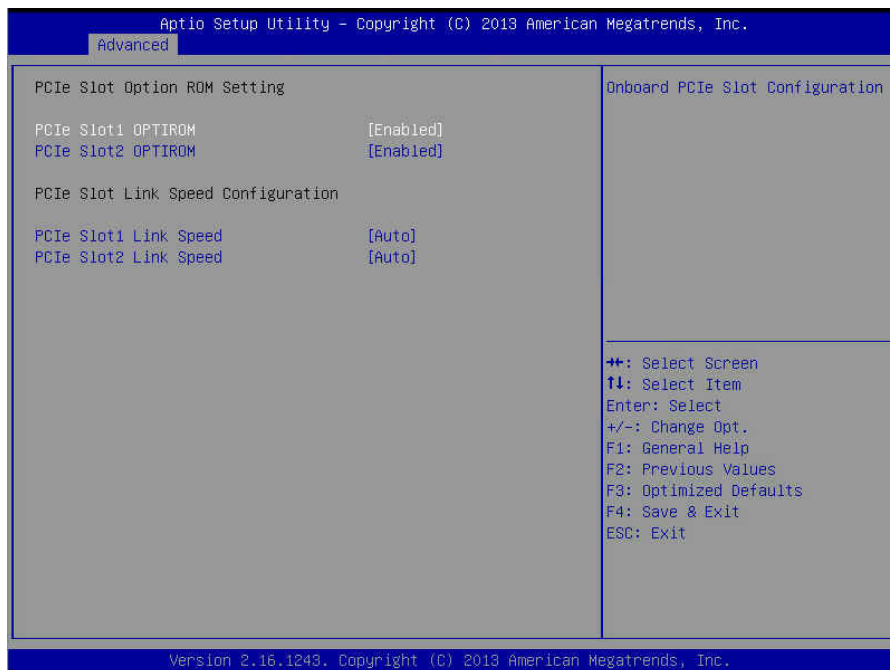
**Disabled** / Enabled

**Wait for “ESC” If Error**

Enable or Disable Wait ESC key Function. When Chassis Intrusion, CMOS Clear or BMC not response.

**Enabled** / Disabled

### 3.3.4 PCIe Slot Configuration



#### PCIe Slot1 OPTIROM

Onboard PCIe Slot Configuration.

**Enabled** / Disabled

#### PCIe Slot2 OPTIROM

Enable/Disable Load OPTROM for PCIe Slot devices.

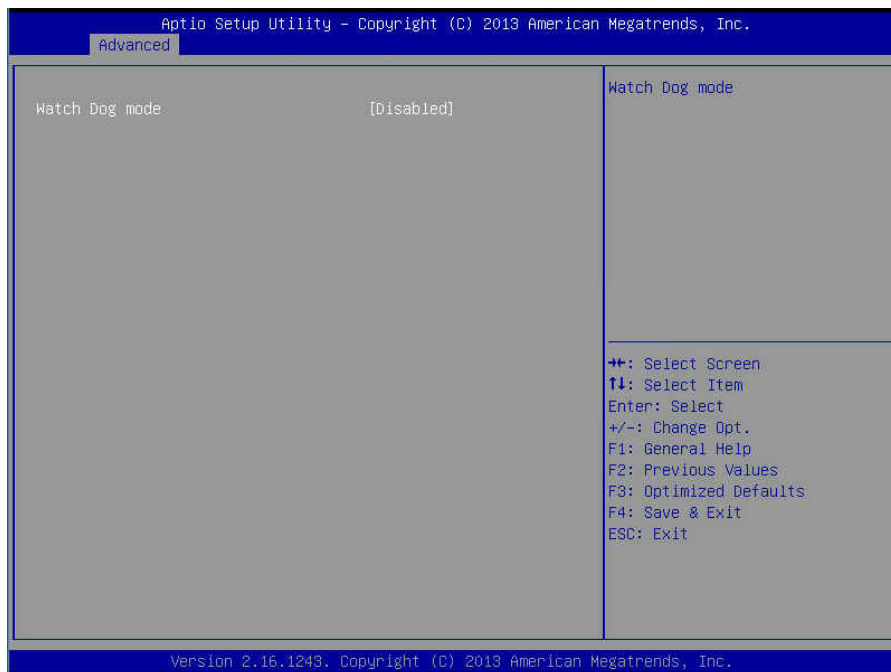
**Enabled** / Disabled

#### PCIe Slot1 Link Speed / PCIe Slot2 Link Speed

OnBoard PCIe Slot Link Speed Configuration.

**Auto** / Gen 1 (2.5GT/s) / Gen 2 (5GT/s) / Gen 3 (8GT/s)

### 3.3.5 Watch Dog Timer Configuration



#### Watch Dog Mode

Watch Dog Mode Help.

**Disabled** / POST / OS / PowerON

**NOTE:** Watch Dog Timer will not appear when Watch Dog Mode is set to [Disabled].

#### Watch Dog Timer

Watch Dog Timer Help.

**2 MINS** / 4 MINS / 6 MINS / 8 MINS / 10 MINS



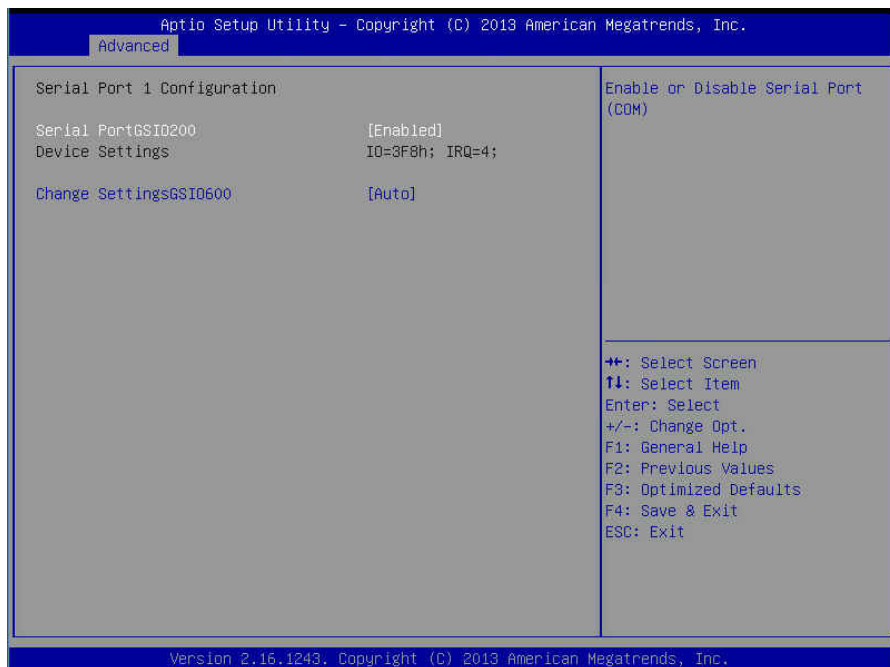
### 3.3.6 ASPEED Super IO Configuration



#### Super IO Chip

Read only.

### 3.3.6.1 Serial Port 1 Configuration



#### Serial PortGSIO200

Enable or disable Serial Port (COM).

**Enabled** / Disabled

#### Device Settings

Read only.

#### Change SettingsGSIO600

Select an optimal setting for Super IO Device.

**Auto** / IO=3F8h; IRQ=4;  
/ IO=3F8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;  
/ IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;  
/ IO=3E8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;  
/ IO=2E8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

### 3.3.6.2 Serial Port 2 Configuration



#### Serial PortGSIO200

Enable or disable Serial Port (COM).

**Enabled** / Disabled

#### Device Settings

Read only.

#### Change SettingsGSIO600

Select an optimal setting for Super IO Device.

**Auto** / IO=3F8h; IRQ=4;  
/ IO=3F8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;  
/ IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;  
/ IO=3E8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;  
/ IO=2E8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

### 3.3.7 S5 RTC Wake Settings

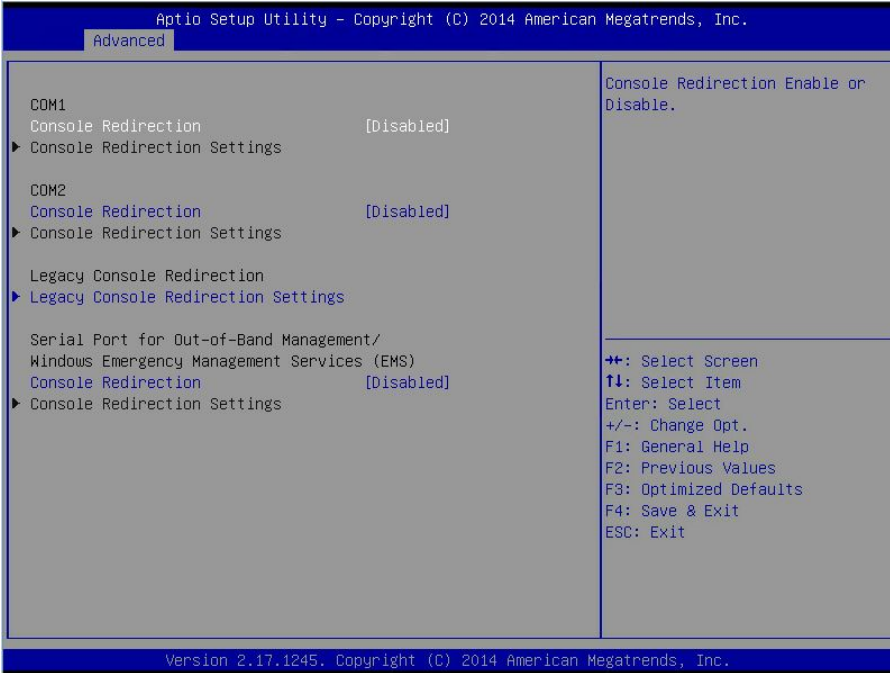


#### Wake system from S5

Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr:min:sec specified. Select Dynamic Time, system will wake on the current time + increase minute(s).

**Disabled** / Fixed Time / Dynamic Time

### 3.3.8 Serial Port Console Redirection



#### COM1/COM2/ Serial Port for Out-Of-Band Management/Windows Emergency Services (EMS)

##### Console Redirection

Console redirection enable or disable.

**Disabled** / Enabled

#### COM1/COM2/ Serial Port for Out-Of-Band Management/Windows Emergency Services (EMS)

##### Console Redirection Settings

The settings specify how the host computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

##### Legacy Console Redirection Settings

Legacy Console redirection settings.

### 3.3.8.1 Console Redirection Settings

Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.	
Advanced	
COM1 Console Redirection Settings	
Terminal Type	[VT100+]
Bits per second	[38400]
Data Bits	[8]
Parity	[None]
Stop Bits	[1]
Flow Control	[None]
VT-UTF8 Combo Key Support	[Enabled]
Recorder Mode	[Disabled]
Resolution 100x31	[Disabled]
Legacy OS Redirection Resolution	[80x24]
Putty KeyPad	[VT100]
Redirection After BIOS POST	[Always Enabled]
Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.	
++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	

Version 2.17.1245. Copyright (C) 2014 American Megatrends, Inc.

#### Terminal Type

Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set.

VT100+: Extends VT100 to support color, function keys, etc.

VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.

**VT100+** / VT100 / VT-UTF8 / ANSI

#### Bits per Second

Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

**38400** / 9600 / 19200 / 57600 / 115200

#### Data Bits

**8** / 7

#### Parity

A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if the num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: parity bit is always 0. Mark and Space parity do not allow for error detection.

**None** / Even / Odd / Mark / Space

### Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

**1** / 2

### Flow Control

Flow Control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to restart the flow. Hardware flow control uses two wires to send start/stop signal.

**None** / Hardware RTS/CTS

### VT-UTF8 Combo Key Support

Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.

**Enabled** / Disabled

### Recorder Mode

On this mode enabled only text will be sent. This is to capture Terminal data.

**Disabled** / Enabled

### Resolution 100x31

Enable or disable extended terminal resolution.

**Disabled** / Enabled

### Legacy OS Redirection Resolution

On Legacy OS, the number of rows and columns supported redirection.

**80x24** / 80x25

### Putty KeyPad

Select FunctionKey and KeyPad on Putty.

**VT100** / LINUX / XTERMR6 / SCO / ESCN / VT400

### Redirection after BIOS POST

The settings specify if BootLoader is selected than Legacy console redirection is disabled before booting to Legacy OS. Default value is Always Enable which means Legacy Console Redirection is enabled for Legacy OS.

**Always Enable** / BootLoader

### 3.3.8.2 Legacy Console Redirection Settings

Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.	
Advanced	
Legacy Serial Redirection Port	[COM1]
Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages	
 ↔: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	

Version 2.17.1245. Copyright (C) 2014 American Megatrends, Inc.

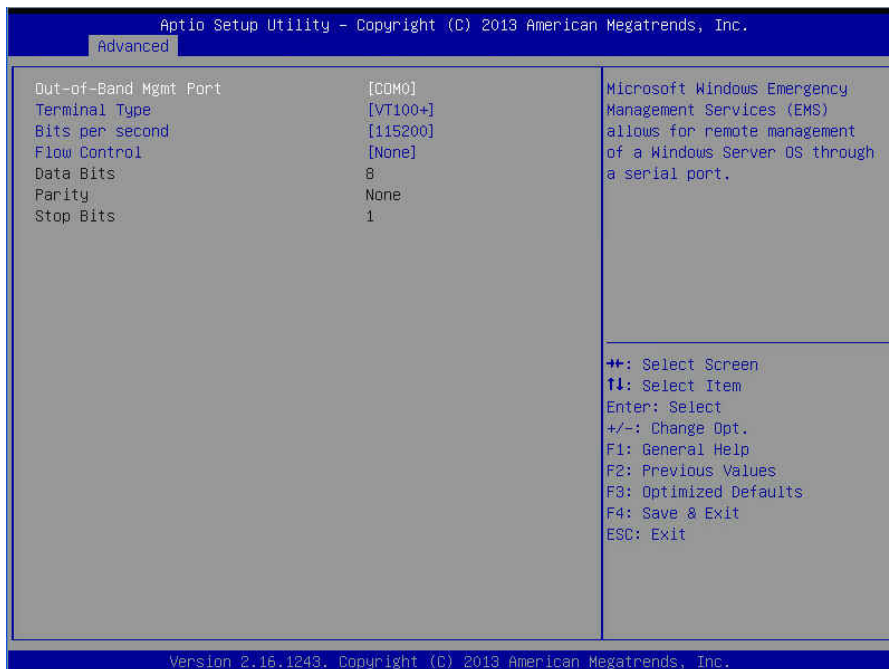
#### Legacy Serial Redirection Port

Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

**COM1** / COM2



### 3.3.8.3 Serial Port for Out-Of-Band Management/Windows Emergency Services (EMS) Console Redirection Settings



#### Out-of-Band Mgmt Port

Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.

**COM0** / COM1

#### Terminal Type

VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.

VT-UTF8 / VT100 / **VT100+** / ANSI

#### Bits per Second

Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

**115200** / 9600 / 19200 / 57600

## **Flow Control**

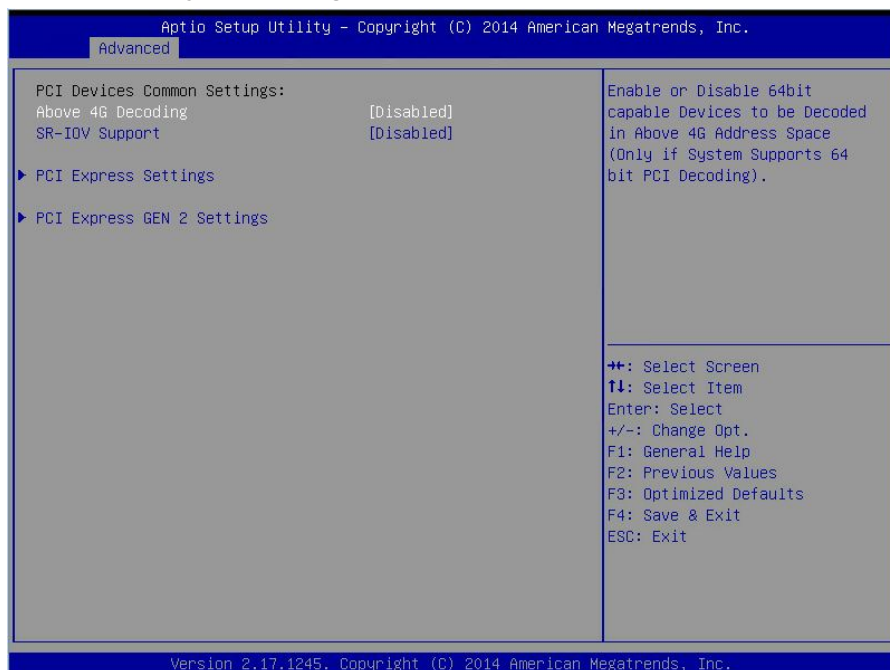
Flow Control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to restart the flow. Hardware flow control uses two wires to send start/stop signal.

**None** / Hardware RTS/CTS / Software Xon/Xoff

## **Data Bits / Parity / Stop Bits**

Read only.

### 3.3.9 PCI Subsystem Settings



#### Above 4G Decoding

Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).

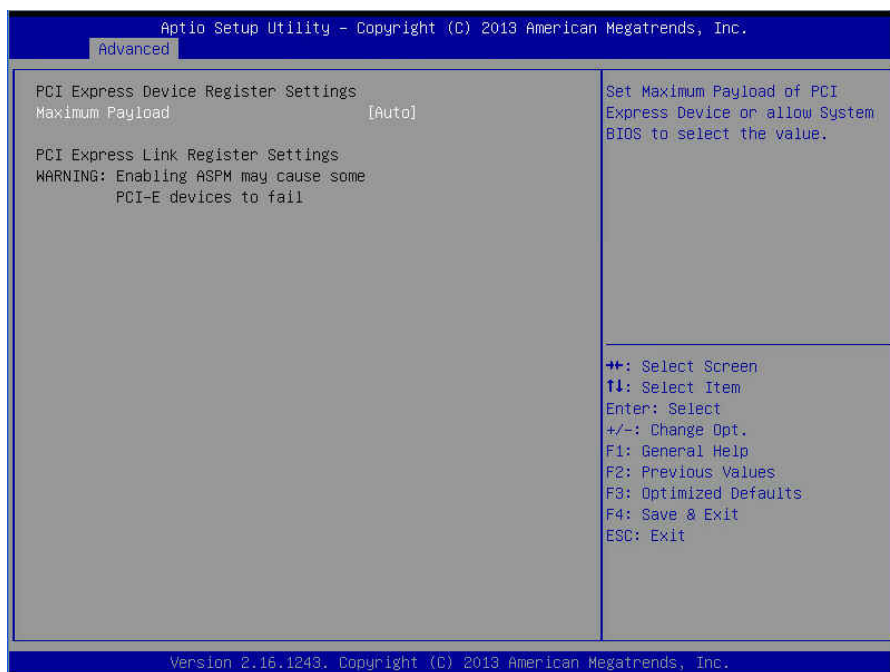
**Disabled** / Enabled

#### SR-IOV Support

If system has SR-IOV capable PCIe Devices, this option enables or disables Single Root IO Virtualization Support.

**Disabled** / Enabled

### 3.3.9.1 PCI Express Settings



#### Maximum Payload

Set Maximum Payload of PCI Express Device or allow System BIOS to select the value.

**Auto** / 128 Bytes / 256 Bytes / 512 Bytes / 1024 Bytes / 2048 Bytes / 4096 Bytes

### 3.3.9.2 PCI Express GEN2 Settings

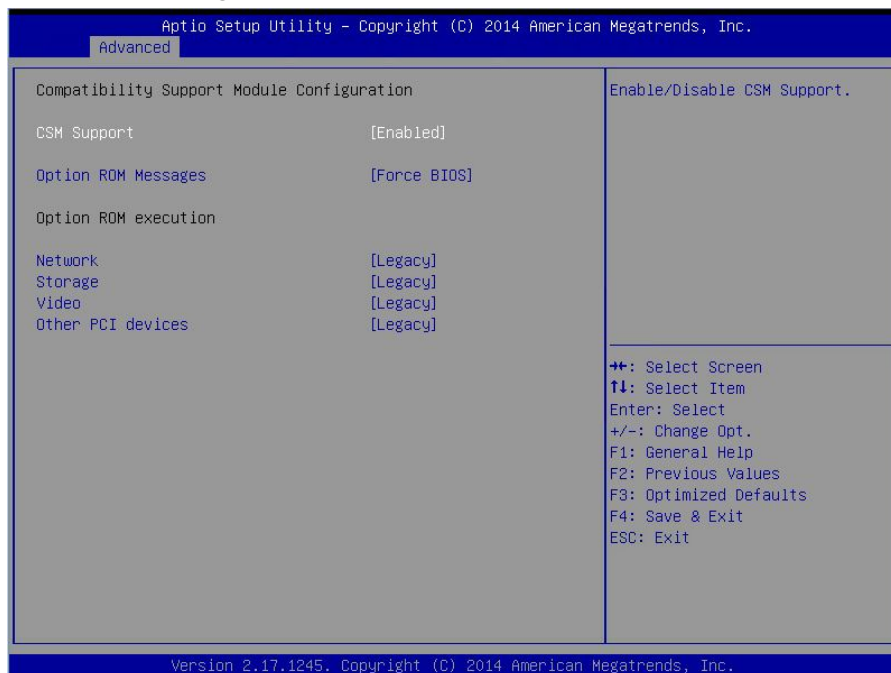


#### ARI Forwarding

If supported by hardware and set to “Enabled”, the Downstream Port disables its traditional Device Number field being 0 enforcement when turning a Type1 Configuration Request into a Type0 Configuration Request, permitting access to Extended Functions in an ARI Device immediately below the Port.

**Disabled** / Enabled

### 3.3.10 CSM Configuration



#### CSM Support

Enable/Disable CSM Support.

**Enabled** / Disabled

#### Option ROM Messages

Set display mode for Option ROM

**Force BIOS** / Keep Current

#### Network

Controls the execution of IEFI and Legacy PXE OpROM.

**Legacy** / Do not launch / UEFI

#### Storage

Controls the execution of UEFI and Legacy Storage OpROM.

**Legacy** / Do not launch / UEFI

#### Video

Controls the execution of UEFI and Legacy Video OpROM

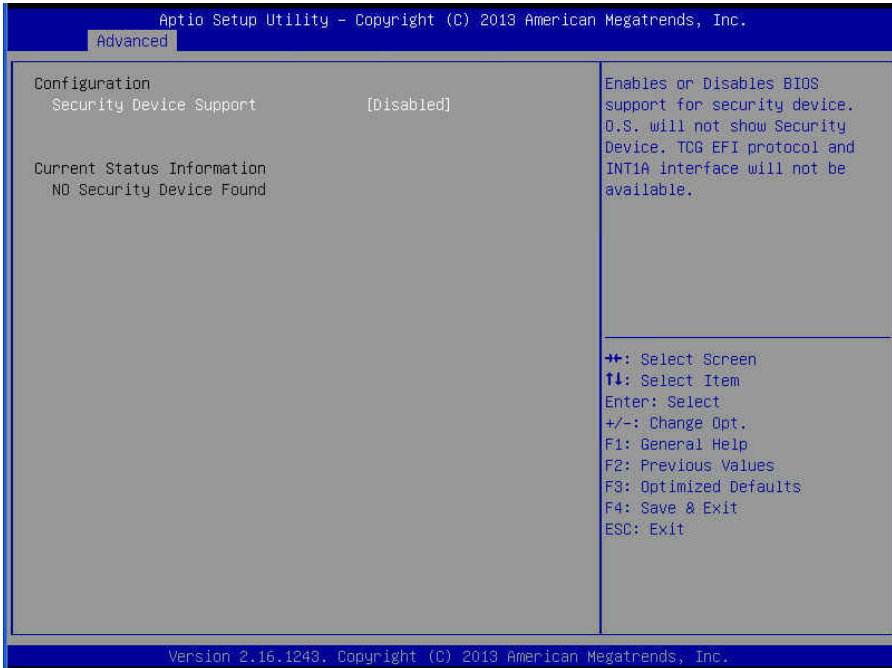
**Legacy** / Do not launch / UEFI

### **Other PCI Devices**

Determines OpROM execution policy for devices other than Network, Storage, or Video.

**Legacy** / Do not launch / UEFI

### 3.3.11 Trusted Computing



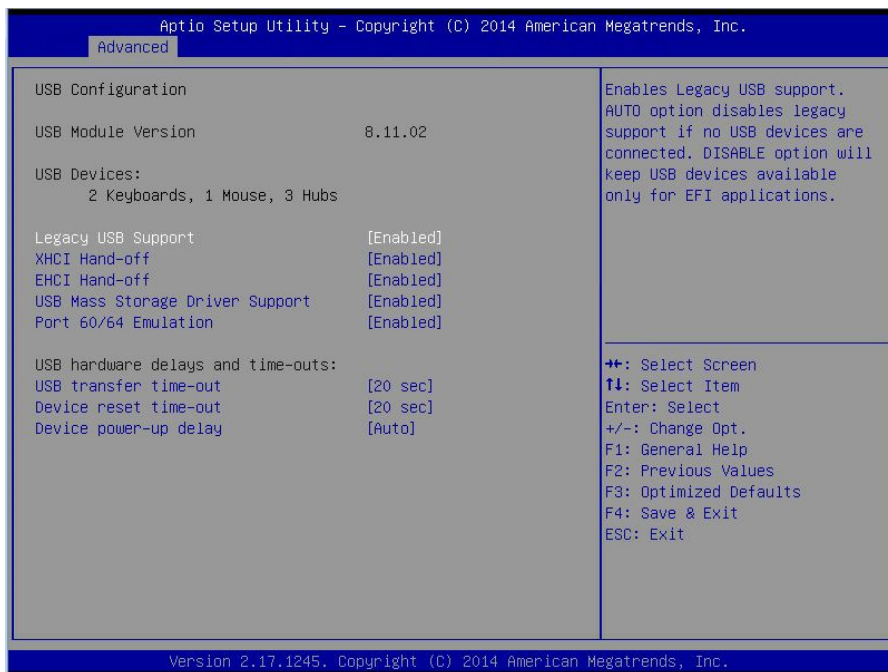
#### Security Device Support

Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1a interface will not be available.

**Disabled** / Enabled



### 3.3.11 USB Configuration



#### USB Module Version / USB Devices

Read only.

#### Legacy USB Support

Enable USB legacy support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

**Enabled** / Disabled / Auto

#### XHCI Hand-off

This is a workaround for OSES without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

**Disabled** / Enabled

#### EHCI Hand-off

This is a workaround for OSES without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

**Disabled** / Enabled

### **USB Mass Storage Driver Support**

Enable/Disable USB Mass Storage Driver Support.

**Enabled** / Disabled

### **Port 60/64 Emulation**

Enables I/O Port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

**Enabled** / Disabled

### **USB transfer time-out**

The time-out value for Control, Bulk and Interrupt transfers.

**20 sec** / 1 sec / 5 sec / 10 sec

### **Device reset time-out**

USB mass storage device Start Unit command time-out.

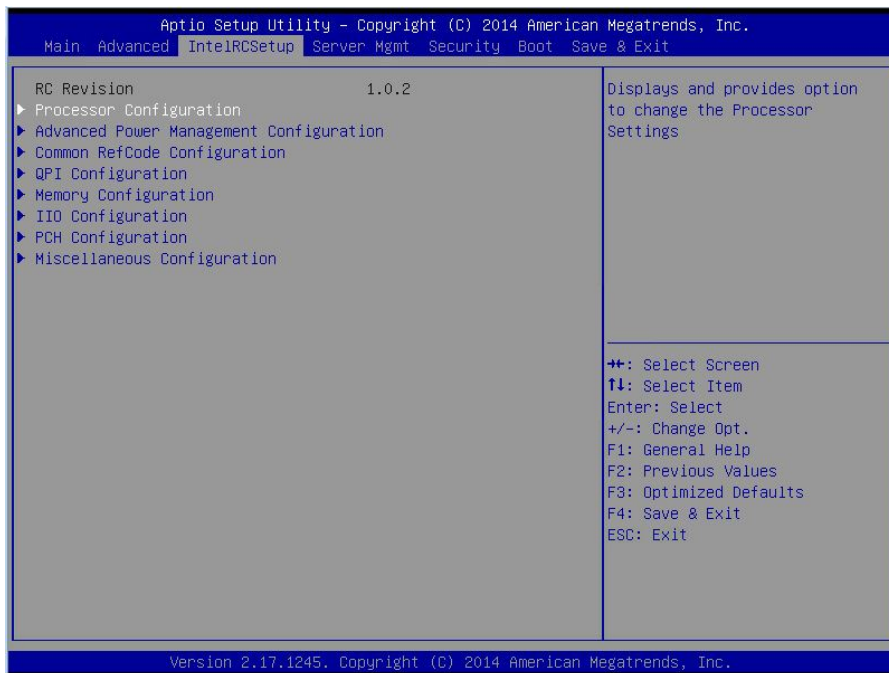
**20 sec** / 10 sec / 30 sec / 40 sec

### **Device power-up delay**

Maximum time the device will take before it properly reports itself to the Host Controller. AUTO uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

**Auto** / Manual

## 3.4 Intel RC Setup



### Processor Configuration

Displays and provides option to change the Processor Settings.

### Advanced Power Management Configuration

Displays and provides option to change the Power Management Settings.

### Common RefCode Configuration

Displays and provides option to change the Common RefCode Settings.

### QPI Configuration

Displays and provides option to change the QPI Settings.

### Memory Configuration

Displays and provides option to change the Memory Settings.

### IIO configuration

Displays and provides option to change the IIO Settings.

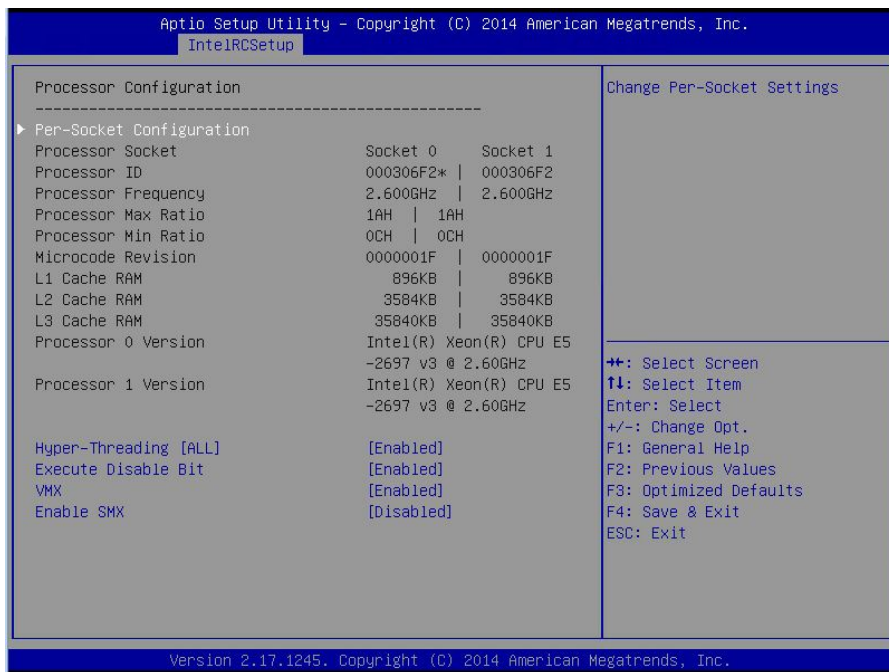
**PCH configuration**

Displays and provides option to change the PCH Settings.

**Miscellaneous Configuration**

Displays and provides option to change the Miscellaneous Settings.

### 3.4.1 Processor Configuration



#### Processor Configuration

Processor related information. Read only.

#### Hyper-Threading [All]

Enables Hyper Threading (Software Method) to Enable/Disable Logical Processor threads.

**Enable** / Disable

#### Execute Disable Bit

When disabled, forces the XD feature flag to always return 0.

**Enable** / Disable

#### VMX

Enables the vanderpool Technology, takes effect after reboot.

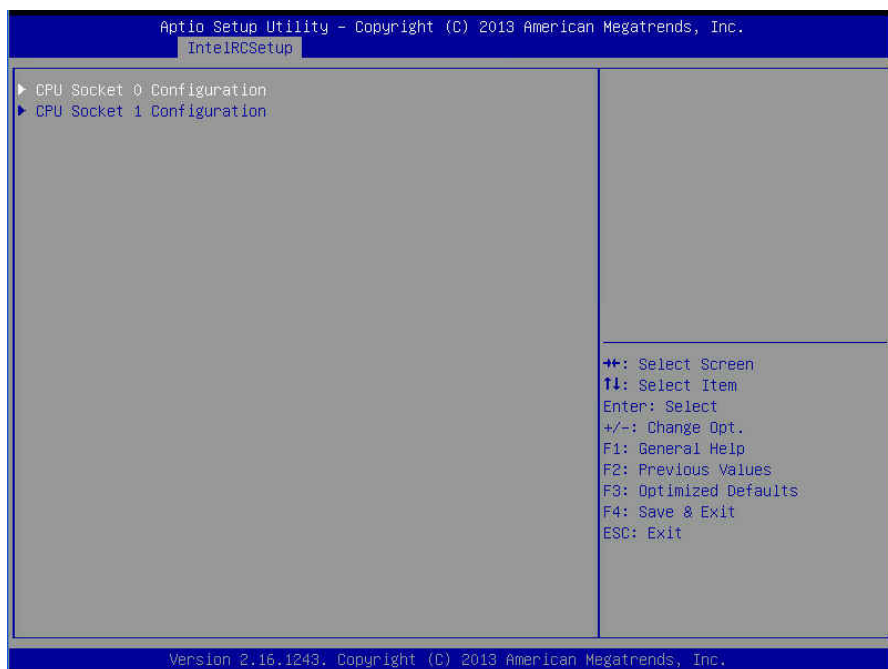
**Enable** / Disable

#### Enable SMX

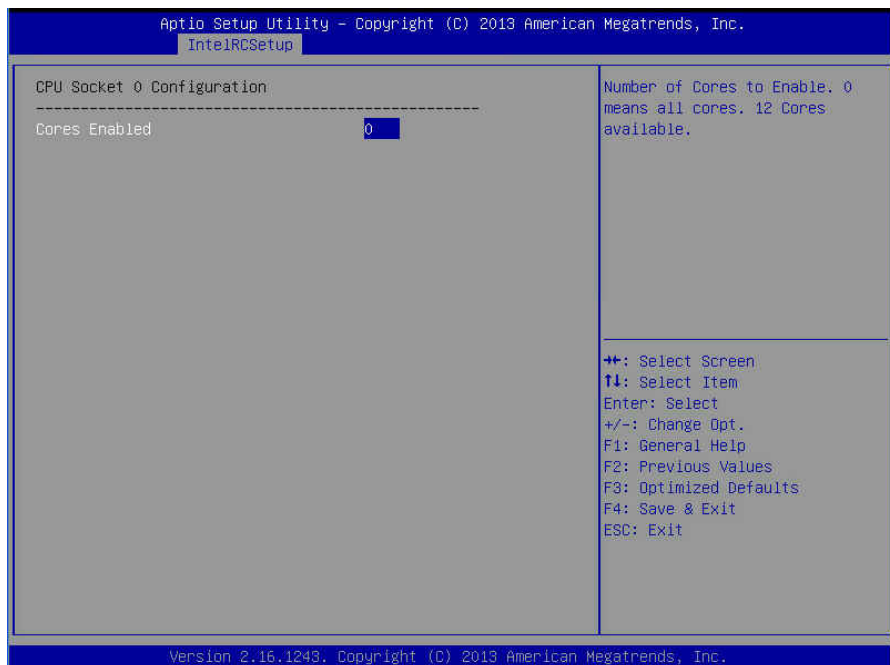
Enables Safer Mode Extensions.

**Disable** / Enable

### 3.4.1.1 Per-Socket Configuration



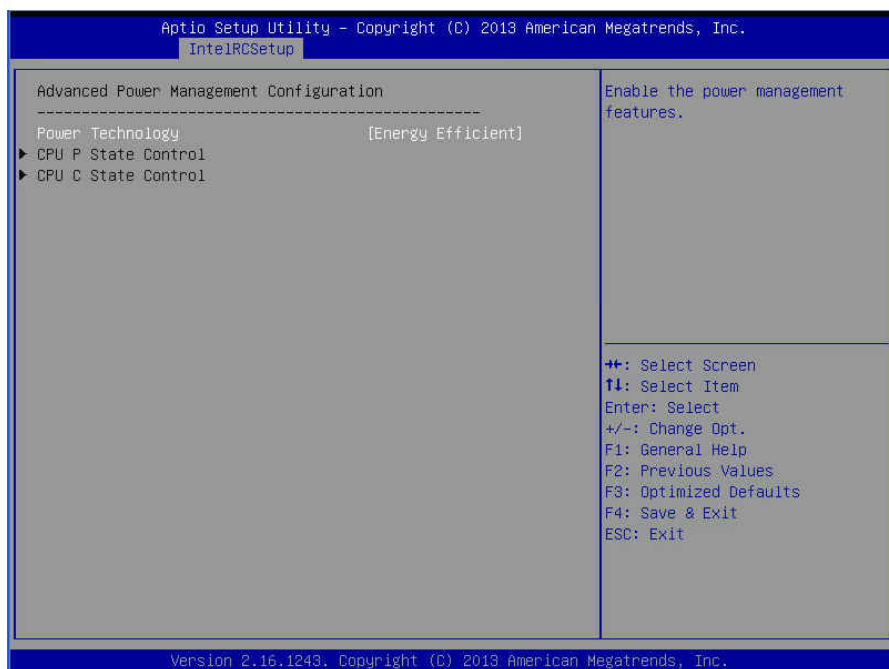
### 3.4.1.1.1 CPU Socket 0 / Socket 1 Configuration



#### Cores Enabled

Number of Cores to Enable. 0 means all cores. 12 Cores available.

### 3.4.2 Advanced Power Management Configuration



#### Power Technology

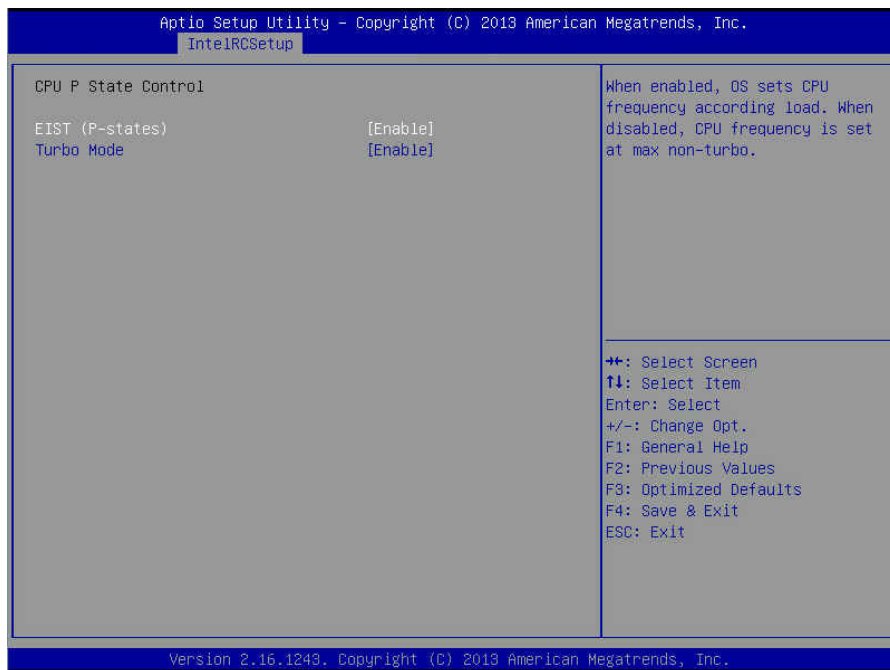
Enable the power management features.

**Energy Efficient** / Disabled / Custom

**NOTE:** *CPU P State Control* and *CPU C State Control* submenu can be modified in user mode when *Power Technology* is set to [Custom].



### 3.4.2.1 CPU P State Control



#### EIST (P-states)

When enabled, OS sets CPU frequency according load. When disabled, CPU frequency is set at max non-turbo.

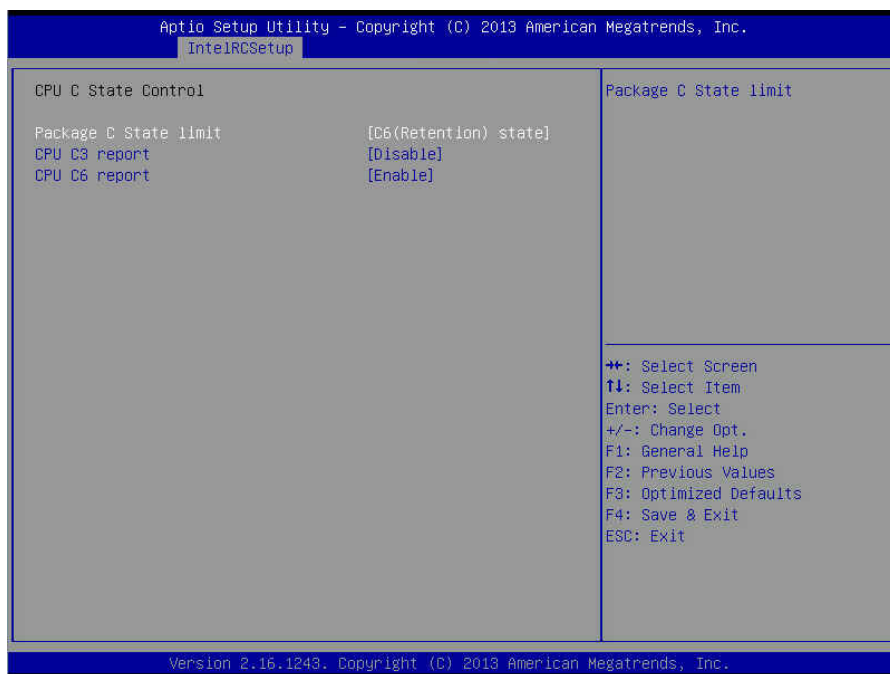
**Enabled** / Disabled

#### Turbo Mode

Turbo mode allows a CPU logical processor to execute a higher frequency when enough power is available not exceed CPU defined limits.

**Enabled** / Disabled

### 3.4.2.2 CPU C State Control



#### Package C State limit

Package C State limit.

C0/C1 state / C2 state / C6 (non Retention) state / **C6 (Retention) state**

#### CPU C3 report

Enable/Disable CPU C3 (ACPI C2) report to OS. Recommended to be disabled.

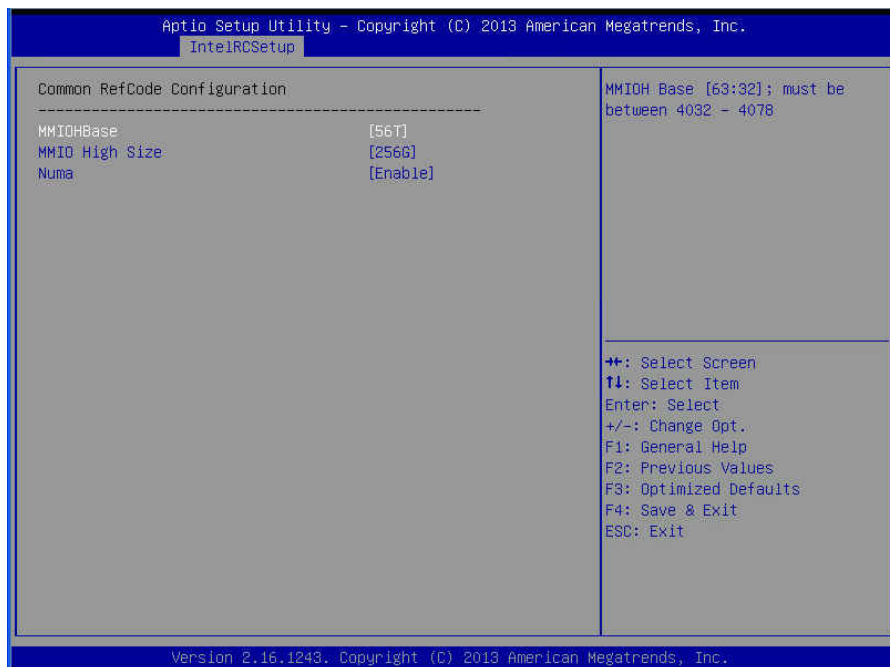
**Disabled** / Enabled

#### CPU C6 report

Enable/Disable CPU C6 (ACPI C2) report to OS. Recommended to be enabled.

Disabled / **Enabled**

### 3.4.3 Common RefCode Configuration



#### MMIOHBase

MMIOH Base [63:32] must be between 4032-4078.

**56T** / 48T / 24T

#### MMIO High Size

Select MMIO High Size.

**256G** / 128G / 512G / 1024G

#### Numa

Enable or Disable Non uniform Memory Access (NUMA).

**Enable** / Disable

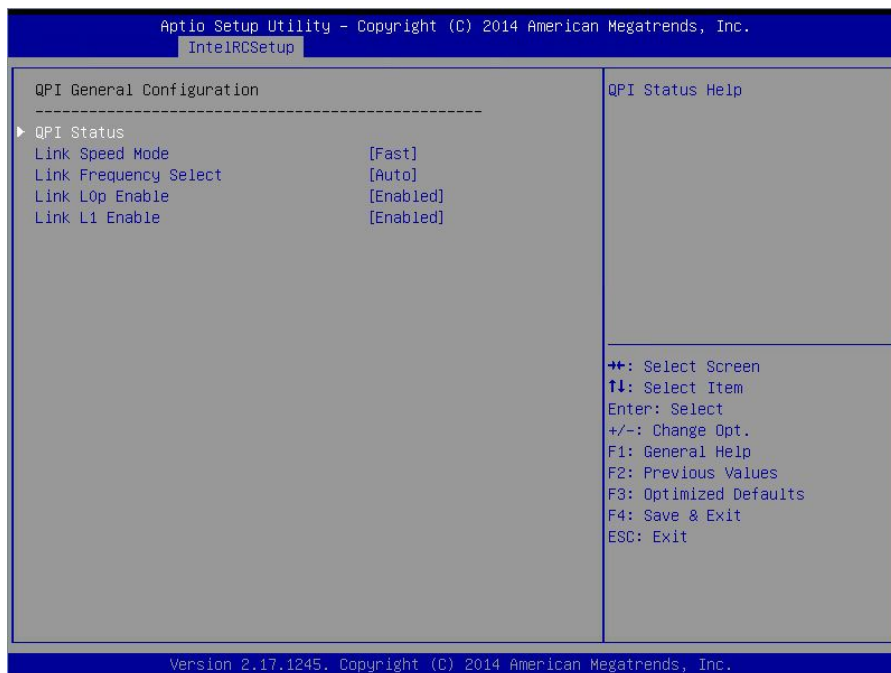
### 3.4.4 QPI Configuration



#### **QPI General Configuration**

Displays and provides option to change the QPI General Settings.

### 3.4.4.1 QPI General Configuration



#### Link Speed Mode

Select the QPI link speed as either the POR speed (Fast) or default speed (Slow).

**Fast** / Slow

#### Link Frequency Select

Allows for selecting the QPI Link Frequency.

**Auto** / 6.4GB/s / 8.0GB/s / 9.6GB/s / Auto Limited

#### Link L0p Enable

Link L0p Enable: Disable, Enable (default)

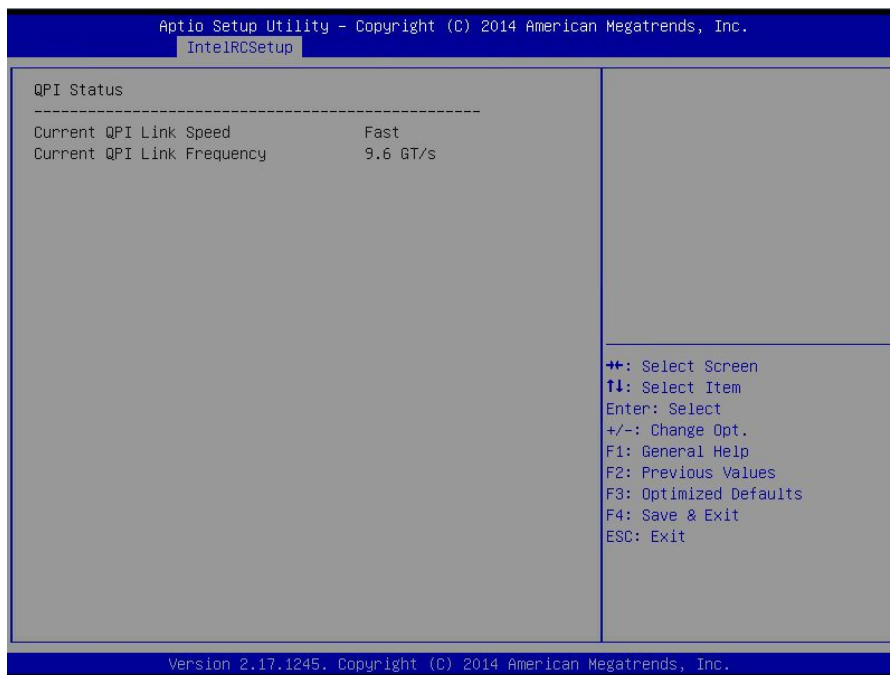
Disabled / **Enabled**

#### Link L1p Enable

Link L1p Enable: Disable, Enable (default)

Disabled / **Enabled**

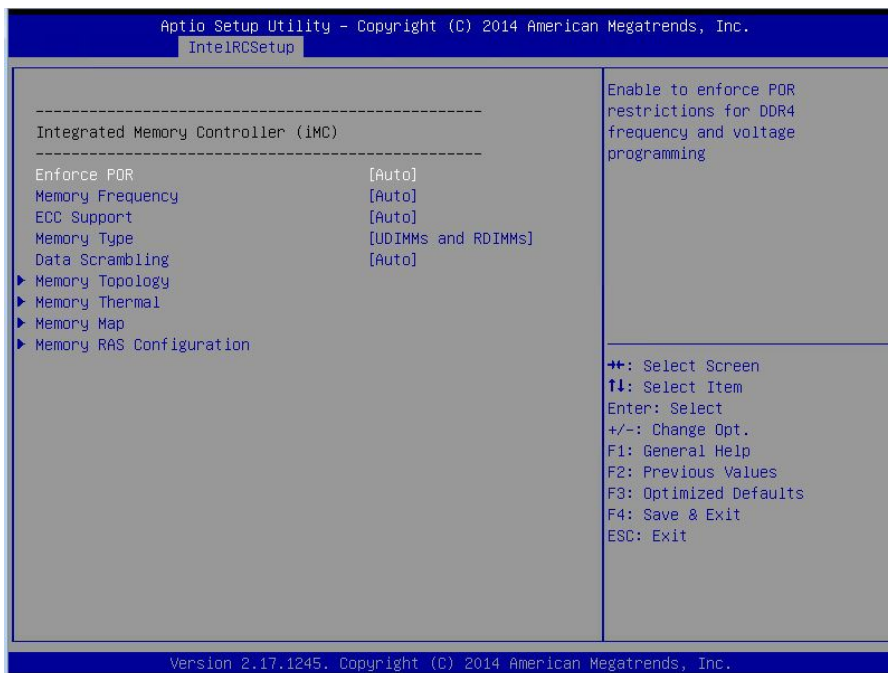
### 3.4.4.1.1 QPI Status



### QPI Status

Read only.

### 3.4.5 Memory Configuration



#### Enforce POR

Enable to enforce POR restrictions for DDR4 frequency and voltage programming.

**Auto** / Enforce POR / Disabled / Enforce Stretch Goals

#### Memory Frequency

Maximum Memory Frequency Selections in Mhz. Do not select Reserved.

**Auto** / 1333 / 1400 / 1600 / 1800 / 1867 / 2000 / 2133 / 2200 / 2400 / 2600 / 2667 / Reserved

#### ECC Support

Enable/disable DDR ECC Support.

**Auto** / Disable / Enable

#### Memory Type

Selects the Memory type supported by this platform.

RDIMMs only / UDIMMs only / **UDIMMs and RDIMMs**

#### Data Scrambling

Enables data scrambling.

**Auto** / Disabled / Enabled

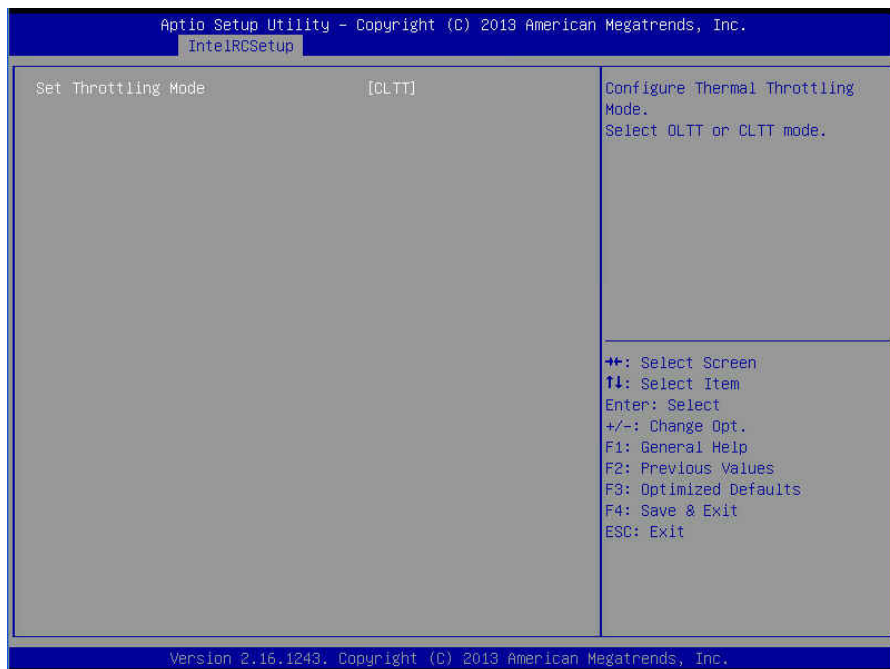
### 3.4.5.1 Memory Topology



This submenu can't be modified in user mode. Read only.



### 3.4.5.2 Memory Thermal

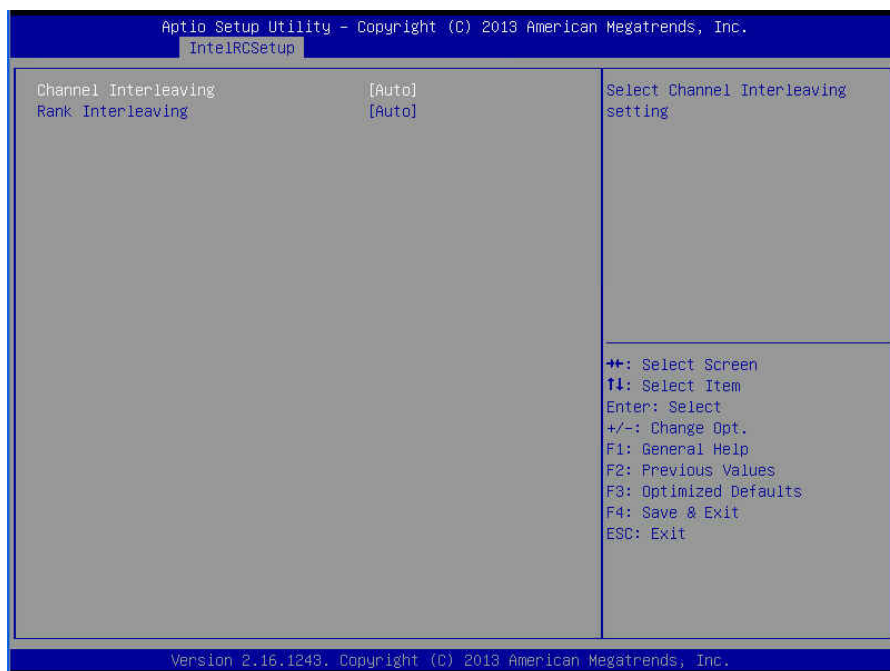


#### Set Throttling Mode

Configure Thermal Throttling Mode. Select OLTT or CLTT mode.

Disabled / OLTT / **CLTT**

### 3.4.5.3 Memory Map



#### Channel Interleaving

Select Channel Interleaving setting.

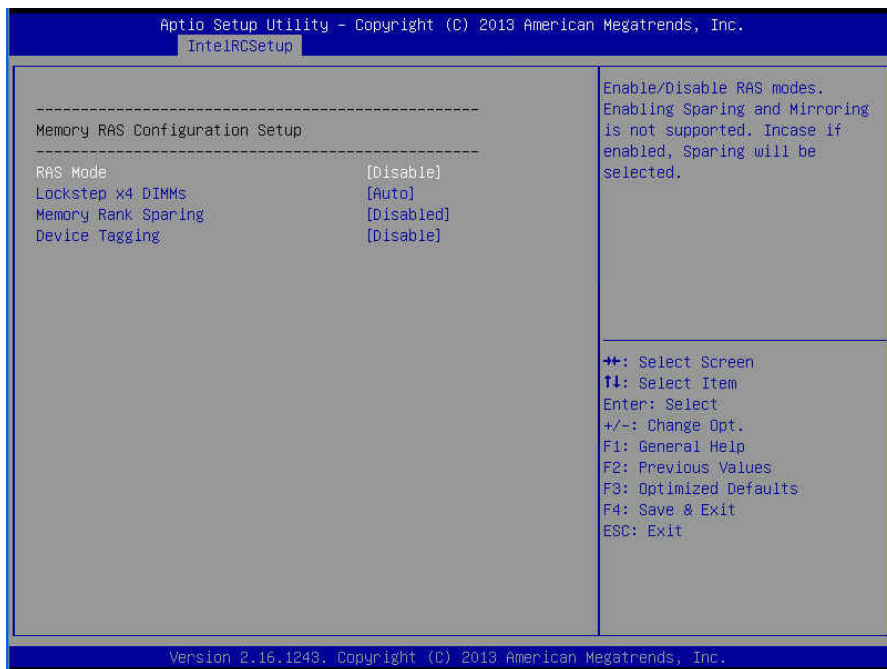
**Auto** / 1-way Interleave / 2-way Interleave / 3-way Interleave / 4-way Interleave

#### Rank Interleaving

Select Rank Interleaving setting.

**Auto** / 1-way Interleave / 2-way Interleave / 4-way Interleave / 8-way Interleave

### 3.4.5.4 Memory RAS Configuration



#### RAS Mode

Enable/Disable RAS modes. Enabling Sparing and Mirroring is not supported. In case if enabled, Sparing will be selected.

**Disable** / Mirror / Lockstep Mode

#### Lockstep x4 DIMMs

Enable/Disable Lockstep for x4 DIMMs.

**Auto** / Disabled / Enabled

#### Memory Rank Sparing

Enable/Disable Memory Rank Sparing.

**Disabled** / Enabled

#### Device Tagging

Enable/Disable Device Tagging

**Disable** / Enable

### 3.4.6 IIO Configuration



#### IOAT Configuration

All IOAT configuration options.

#### Intel VT for Directed I/O (VT-d)

Press <Enter> to bring up the Intel VT for Directed I/O (VT-d) Configuration menu.

### 3.4.6.1 IOAT Configuration



#### Enable IOAT

Control to enable/disable IOAT devices.

**Disable** / Enable

### 3.4.6.2 Intel VT for Directed I/O (VT-d)

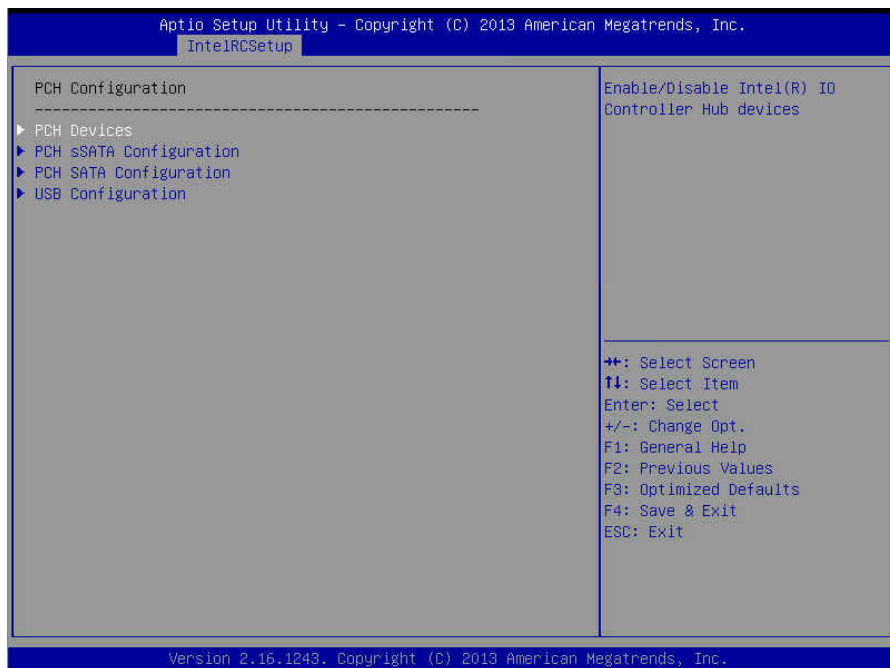


#### Intel VT for Directed I/O (VT-d)

Enable/Disable Intel Virtualization Technology for Directed I/O (VT-d) by reporting the I/O device assignment to VMM through DMAR ACPI Tables.

**Enable** / Disable

### 3.4.7 PCH Configuration



#### **PCH Devices**

Enable/Disable Intel® IO Controller Hub devices

#### **PCH sSATA Configuration**

sSATA devices and settings.

#### **PCH SATA Configuration**

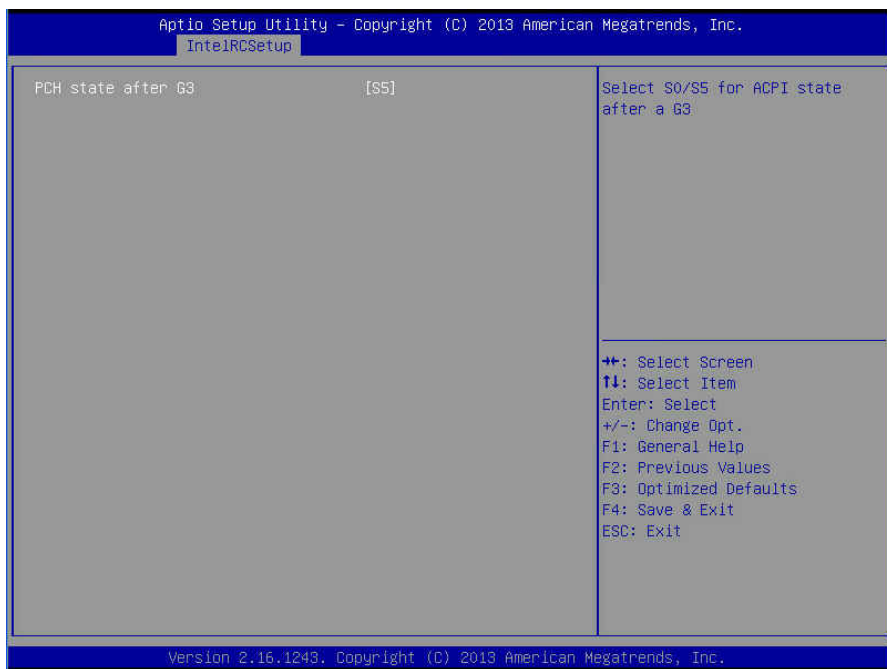
SATA devices and settings.

#### **USB Configuration**

USB Configuration Settings.

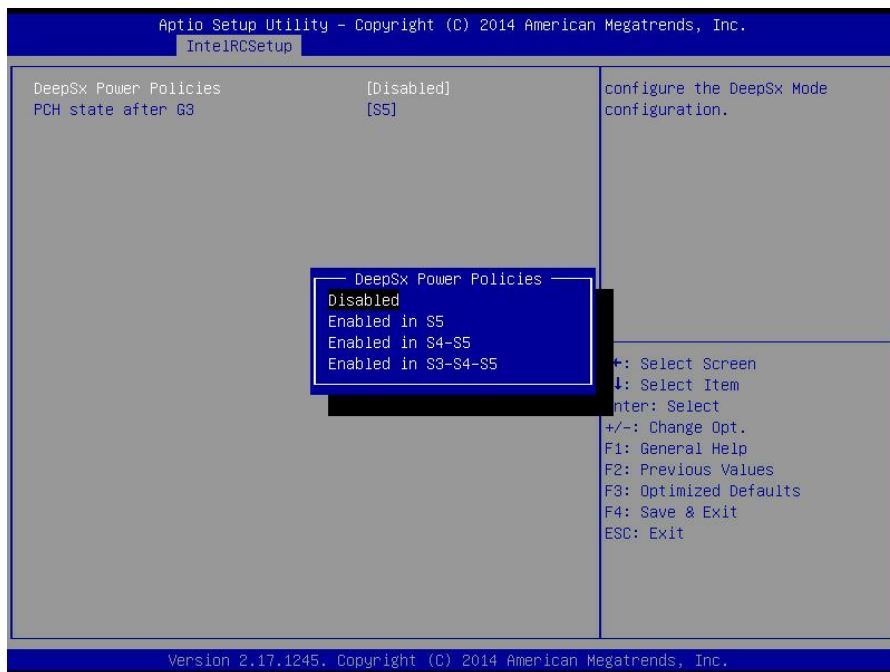
### 3.4.7.1 PCH Devices

#### S7076GM2NR (AST2400)





## S7076G2NR-AKA (AST1400)



### DeepSx Power Policies

Configure the DeepSx Mode configuration.

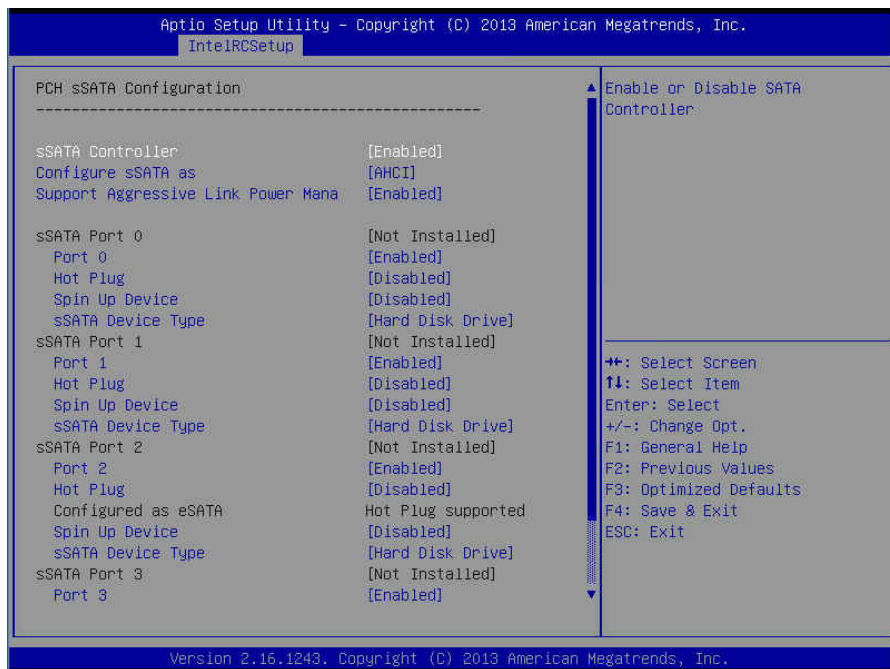
**Disabled** / Enabled in S5 / Enabled in S4-S5 / Enabled in S3-S4-S5

### PCH state after G3

Select S0/S5 for ACPI state after a G3.

**S5** / S0 / Last State

### 3.4.7.2 PCH sSATA Configuration



#### sSATA Controller

Enable or Disable SATA Controller.

**Enabled** / Disabled

#### Configure sSATA as

Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

IDE / **AHCI** / RAID

#### Support Aggressive Link Power Management

Enable/Disable SALP.

**Enabled** / Disabled

#### sSATA Port 0/1/2/3

Read only.

#### Port 0/1/2/3

Enable or Disable SATA Port

**Enabled** / Disabled

**Hot Plug**

Designates this port as Hot Pluggable.

**Disabled** / Enabled

**Spin Up Device**

If enabled for any of ports Staggered Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.

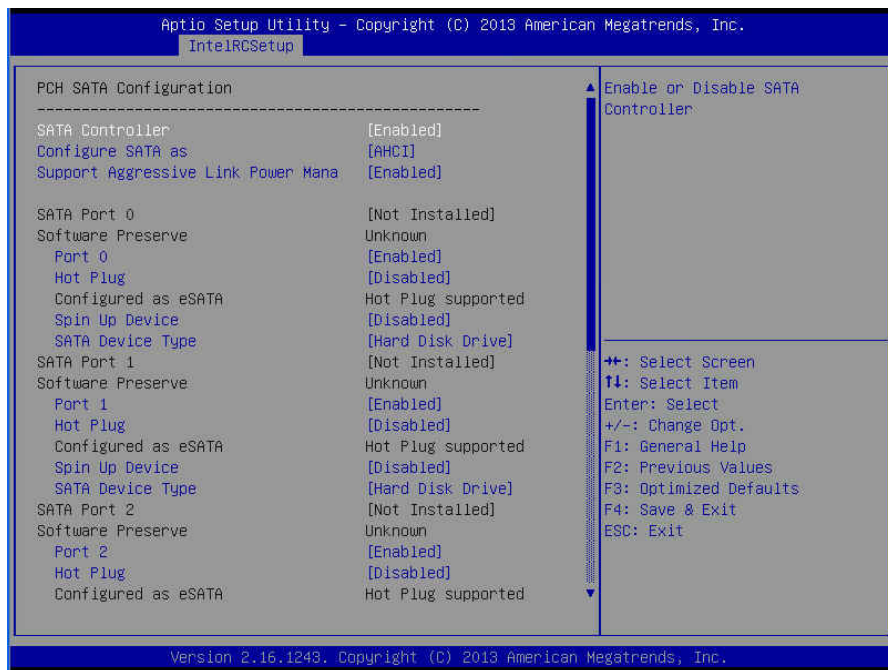
**Disabled** / Enabled

**sSATA Device Type**

Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

**Hard Disk Drive** / Solid State Drive

### 3.4.7.3 PCH SATA Configuration



## SATA Controller

Enable or Disable SATA Controller.

**Enabled** / Disabled

## Configure SATA as

Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

IDE / **AHCI** / RAID

## Support Aggressive Link Power Management

Enable/Disable SALP.

**Enabled** / Disabled

**SATA Port 0/1/2/3**

Read only.

## Software Preserve

Read only.

**Port 0/1/2/3**

Enable or Disable SATA Port

**Enabled** / Disabled

**Hot Plug**

Designates this port as Hot Pluggable.

**Disabled** / Enabled

**Configured as eSATA**

Read only.

**Spin Up Device**

If enabled for any of ports Staggered Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.

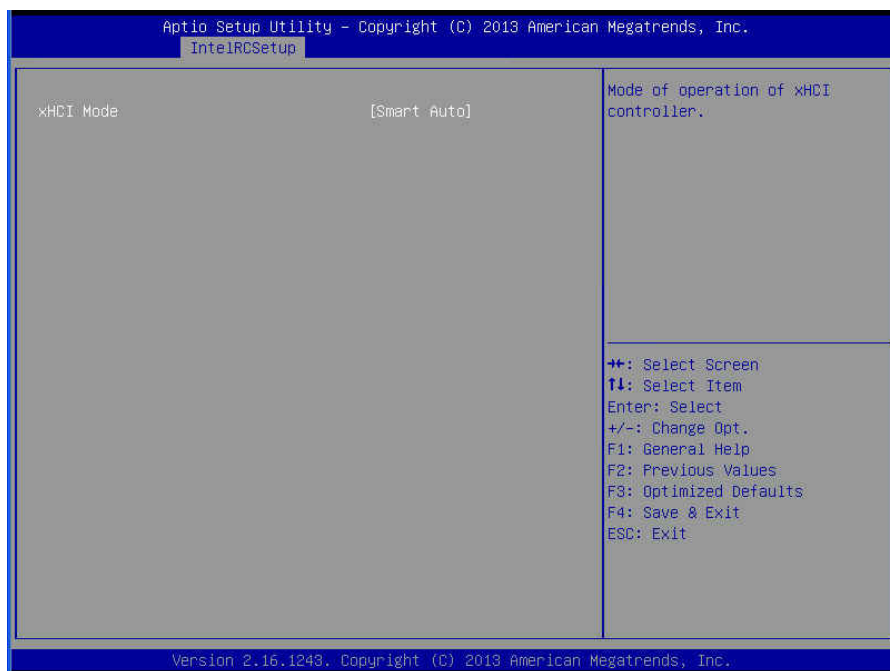
**Disabled** / Enabled

**SATA Device Type**

Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

**Hard Disk Drive** / Solid State Drive

### 3.4.7.4 USB Configuration

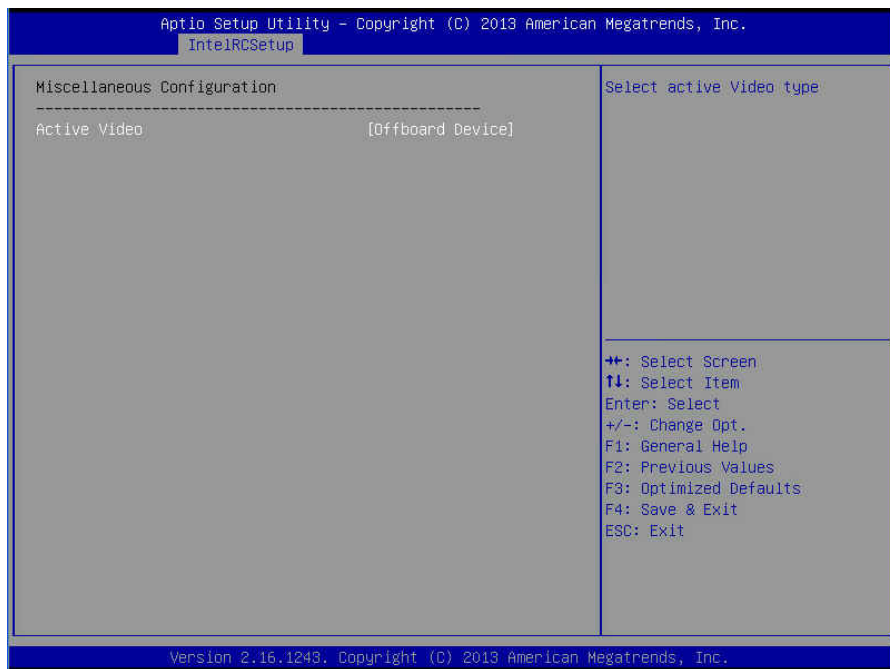


#### XHCI Mode

Mode of operation of XHCI controller.

**Smart Auto** / Auto / Enabled / Disabled / Manual

### 3.4.8 Miscellaneous Configuration

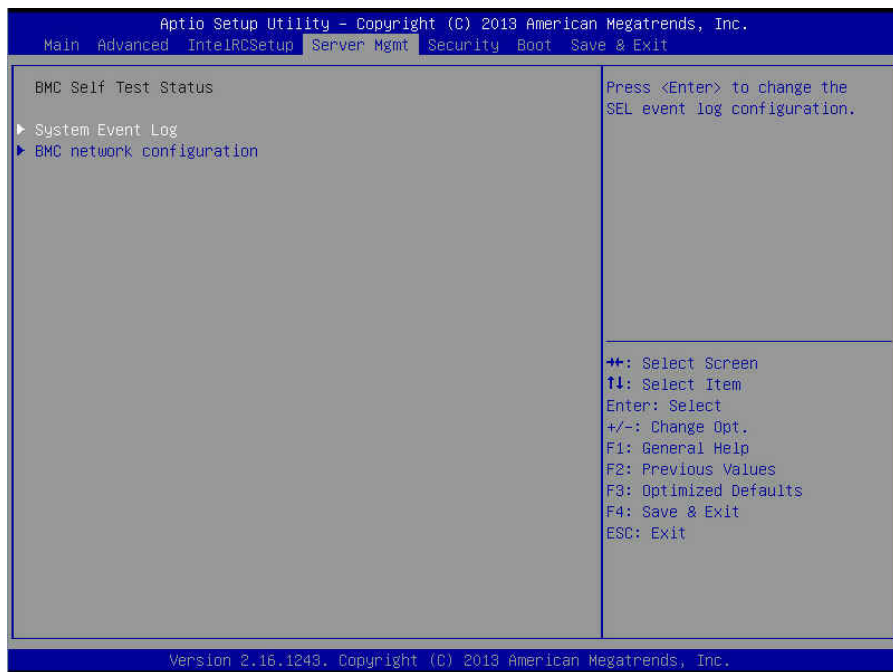


#### Active Video

Select active Video type.

**Offboard Device** / Onboard Device

## 3.5 Server Management (reserved for BB)



### System Event Log

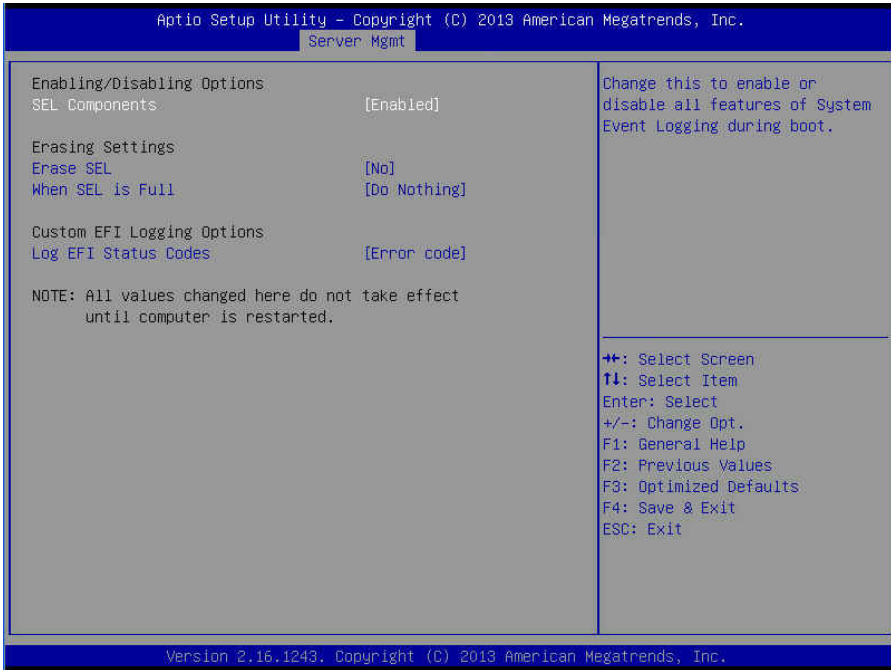
Press <Enter> to change the SEL event log configuration.

### BMC network configuration

Configure BMC network parameters.



### 3.5.1 System Event Log



#### SEL Components

Change this to enable or disable all features of System Event Logging during boot.

**Enabled** / Disabled

#### Erase SEL

Choose options for erasing SEL.

**No** / Yes, on next reset / No, on every reset

#### When SEL is Full

Choose options for reactions to a full SEL.

**Do Nothing** / Erase Immediately

#### Log EFI Status Codes

Disable the logging of EFI Status Codes or log only error code or only progress code or both.

Both / Disabled / **Error Code** / Progress Code

### 3.5.2 BMC Network Configuration

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.	
Server Mgmt	
BMC network configuration	
Lan channel 1	
IP Address Source	DHCP
Configure IP source	[Current setting]
Station IP address	10.83.33.84
Subnet mask	255.255.255.0
Station MAC address	00-e0-b1-ef-87-b0
Router IP address	10.83.33.254
Router MAC address	00-13-60-74-72-7f

Select to configure LAN channel parameters statically or dynamically (by BIOS or BMC). "Current setting" option will not modify any BMC network parameters during BIOS phase.

++: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F3: Optimized Defaults  
F4: Save & Exit  
ESC: Exit

Version 2.16.1243, Copyright (C) 2013 American Megatrends, Inc.

#### Configuration IP Source

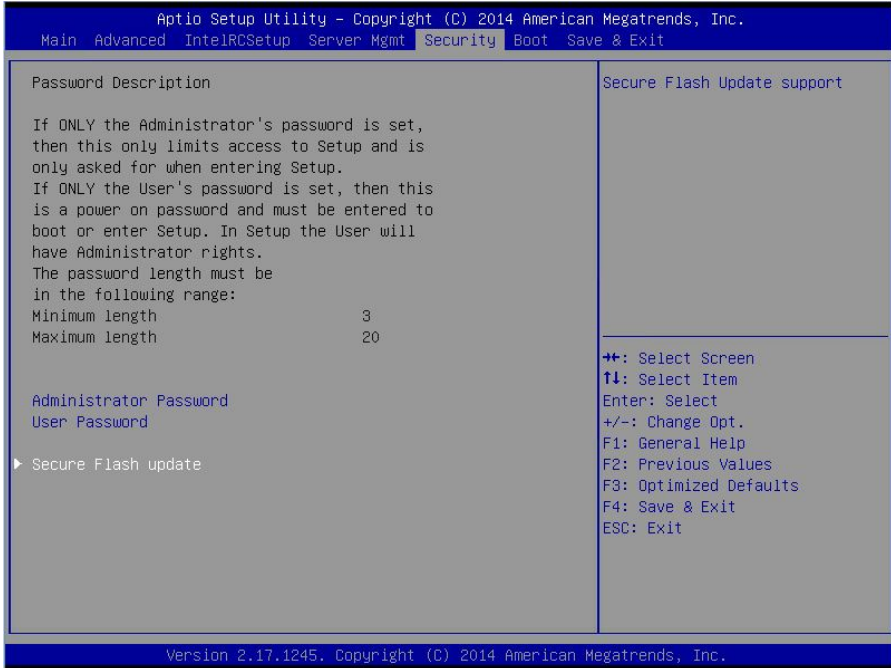
Select to configure LAN channel parameters statically or dynamically (by BIOS or BMC). "Current setting" option will not modify any BMC network parameters during BIOS phase.

**Current setting** / Static / DHCP

**IP Address Source / Station IP address / Subnet mask / Station MAC address / Router IP address / Router MAC address**

Read only.

## 3.6 Security



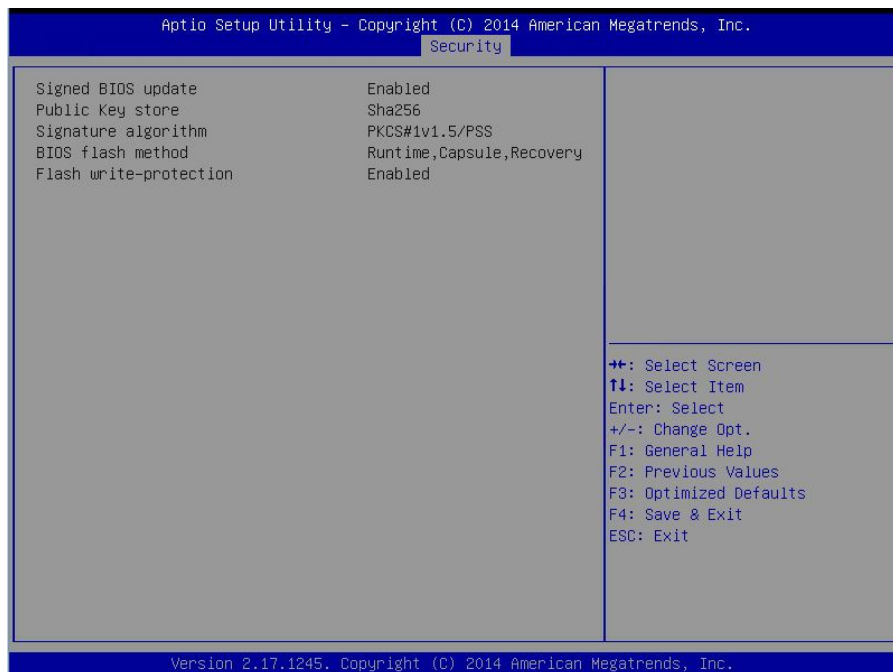
### Administrator Password

Set administrator password in the **Create New Password** window. After you key in the password, the **Confirm New Password** window will pop out to ask for confirmation.

### User Password

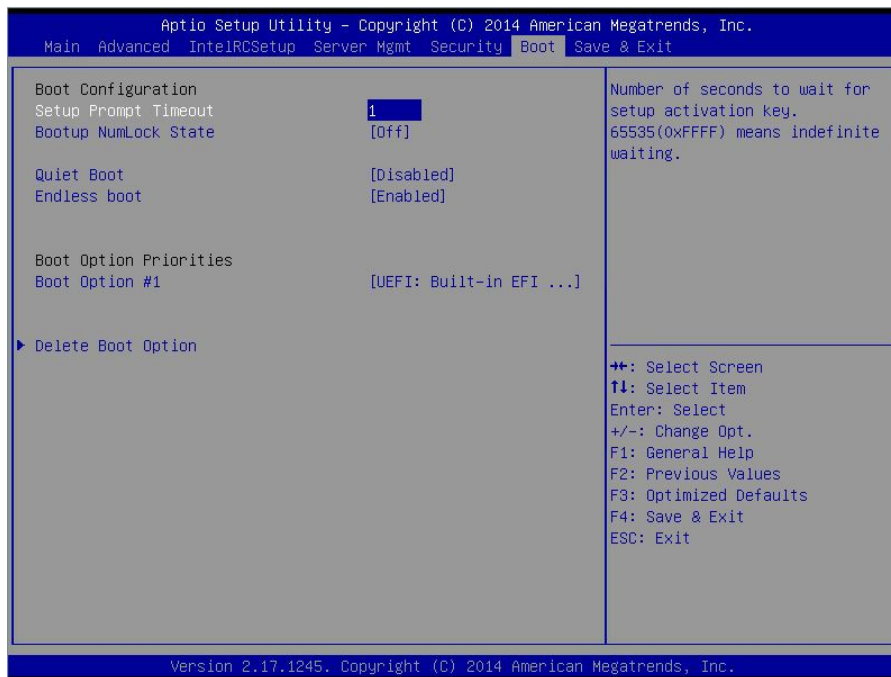
Set user password in the **Create New Password** window. After you key in the password, the **Confirm New Password** window will pop out to ask for confirmation.

### 3.6.1 Secure Flash Update



Read only.

## 3.7 Boot



### Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

**1**

### Bootup NumLock State

Select the keyboard NumLock state.

**On** / Off

### Quiet Boot

Enable or disable Quiet Boot option.

**Disabled** / Enabled

### Endless Boot

Enable or disable Endless Boot option.

**Disabled** / Enabled

### Boot Option #1

Set the system boot order.

**UEFI: SanDisk** (Device name) / Disabled

### 3.7.1 Delete Boot Option

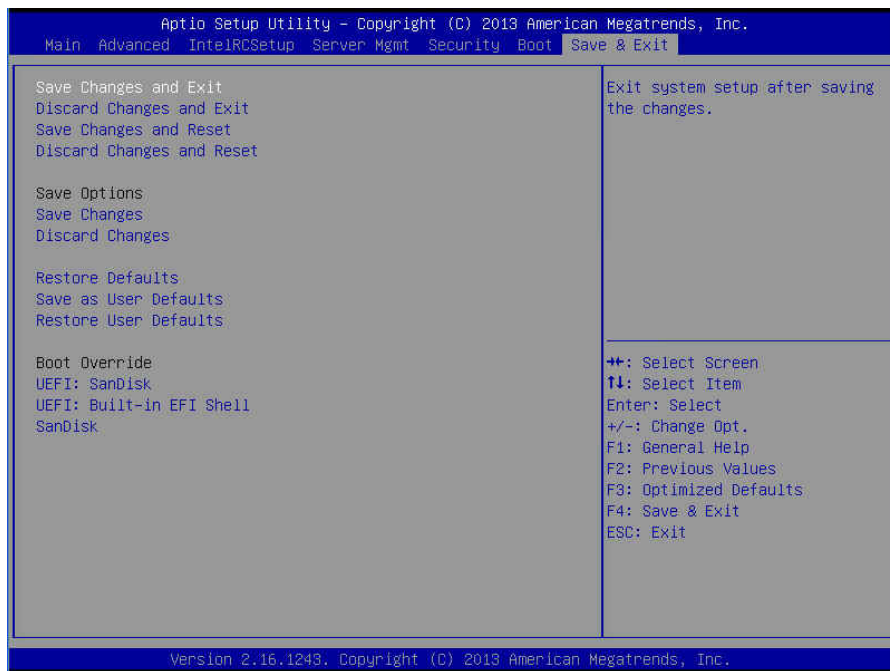


#### Delete Boot Option

Remove an EFI boot option from the boot order.

**Select one to Delete** / UEFI: Built-in EFI Shell / UEFI: SanDisk

## 3.8 Save & Exit



### Save Changes and Exit

Exit system setup after saving the changes.

### Discard Changes and Exit

Exit system setup without saving any changes.

### Save Changes and Reset

Reset the system after saving the changes.

### Discard Changes and Reset

Reset system setup without saving any changes.

### Save Options

Read only.

### Save Changes

Save changes done so far to any of the setup options.

### Discard Changes

Discard changes done so far to any of the setup options.

**Restore Defaults**

Restore/Load Default values for all the setup options.

**Save as User Defaults**

Save the changes done so far as User Defaults.

**Restore User Defaults**

Restore the User Defaults to all the setup options.



## Chapter 4: Diagnostics

---

**NOTE:** if you experience problems with setting up your system, always check the following things in the following order:

### Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN website at <http://www.tyan.com>.

## 4.1 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN web site at <http://www.tyan.com>

**NOTE:** Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN be held responsible for damages done by the end user.

## 4.2 AMIBIOS Post Code (Aptio)

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

### Checkpoint Ranges

Status Code Range	Description
0x01 – 0x0B	SEC execution
0x0C – 0x0F	SEC errors
0x10 – 0x2F	PEI execution up to and including memory detection
0x30 – 0x4F	PEI execution after memory detection
0x50 – 0x5F	PEI errors
0x60 – 0x8F	DXE execution up to BDS
0x90 – 0xCF	BDS execution
0xD0 – 0xDF	DXE errors
0xE0 – 0xE8	S3 Resume (PEI)
0xE9 – 0xEF	S3 Resume errors (PEI)
0xF0 – 0xF8	Recovery (PEI)
0xF9 – 0xFF	Recovery errors (PEI)

### Standard Checkpoints

#### SEC Phase

Status Code	Description
0x00	Not used
<b>Progress Codes</b>	
0x01	Power on. Reset type detection (soft/hard).
0x02	AP initialization before microcode loading
0x03	North Bridge initialization before microcode loading
0x04	South Bridge initialization before microcode loading
0x05	OEM initialization before microcode loading
0x06	Microcode loading
0x07	AP initialization after microcode loading
0x08	North Bridge initialization after microcode loading
0x09	South Bridge initialization after microcode loading
0x0A	OEM initialization after microcode loading
0x0B	Cache initialization

<b>SEC Error Codes</b>	
0x0C – 0x0D	Reserved for future AMI SEC error codes
0x0E	Microcode not found
0x0F	Microcode not found

## SEC Beep Codes

None

## PEI Phase

<b>Status Code</b>	<b>Description</b>
<b>Progress Codes</b>	
0x10	PEI Core is started
0x11	Pre-memory CPU initialization is started
0x12	Pre-memory CPU initialization (CPU module specific)
0x13	Pre-memory CPU initialization (CPU module specific)
0x14	Pre-memory CPU initialization (CPU module specific)
0x15	Pre-memory North Bridge initialization is started
0x16	Pre-Memory North Bridge initialization (North Bridge module specific)
0x17	Pre-memory North Bridge initialization (North Bridge module specific)
0x18	Pre-Memory North Bridge initialization (North Bridge module specific)
0x19	Pre-memory South Bridge initialization is started
0x1A	Pre-Memory South Bridge initialization (South Bridge module specific)
0x1B	Pre-memory South Bridge initialization (South Bridge module specific)
0x1C	Pre-Memory South Bridge initialization (South Bridge module specific)
0x1D – 0x2A	OEM pre-memory initialization codes
0x2B	Memory initialization. Serial Presence Detect (SPD) data reading
0x2C	Memory initialization. Memory presence detection
0x2D	Memory initialization. Programming memory timing information
0x2E	Memory initialization. Configuring memory
0x2F	Memory initialization (other)
0x30	Reserved for ASL (see ASL Status Codes section below)
0x31	Memory Installed
0x32	CPU post-memory initialization is started
0x33	CPU post-memory initialization. Cache initialization
0x34	CPU post-memory initialization. Application Processor(s) (AP) initialization
0x35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
0x36	CPU post-memory initialization. System Management Mode(SMM) initialization
0x37	Post-Memory North Bridge initialization is started

Status Code	Description
0x38	Post-Memory North Bridge initialization (North Bridge module specific)
0x39	Post-Memory North Bridge initialization (North Bridge module specific)
0x3A	Post-Memory North Bridge initialization (North Bridge module specific)
0x3B	Post-Memory South Bridge initialization is started
0x3C	Post-Memory South Bridge initialization (South Bridge module specific)
0x3D	Post-Memory South Bridge initialization (South Bridge module specific)
0x3E	Post-Memory South Bridge initialization (South Bridge module specific)
0x3F – 0x4E	OEM post memory initialization codes
0x4F	DXE IPL is started
<b>PCI Error Codes</b>	
0x50	Memory initialization error. Invalid memory type or incompatible memory speed
0x51	Memory initialization error. SPD reading has failed
0x52	Memory initialization error. Invalid memory size or memory modules do not match
0x53	Memory initialization error. No usable memory detected
0x54	Unspecified memory initialization error
0x55	Memory not installed
0x56	Invalid CPU type or speed
0x57	CPU mismatch
0x58	CPU self test failed or possible CPU cache error
0x59	CPU microcode is not found or microcode update is failed
0x5A	Internal CPU error
0x5B	Reset PPI is not available
0x5C – 0x5F	Reserved for future AMI error codes
<b>S3 Resume Progress Codes</b>	
0xE0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL)
0xE1	S3 Boot Script execution
0xE2	Video repost
0xE3	OS S3 wake vector call
0xE4 – 0xE7	Reserved for future AMI progress codes
<b>S3 Resume Error Codes</b>	
0xE8	S3 Resume Failed
0xE9	S3 Resume PPI not Found
0xEA	S3 Resume Boot Script Error
0xEB	S3 OS Wake Error
0xEC – 0xEF	Reserved for future AMI error codes

Recovery Progress Codes	
0xF0	Recovery condition triggered by firmware (Auto recovery)
0xF1	Recovery condition triggered by user (Forced recovery)
0xF2	Recovery process started
0xF3	Recovery firmware image is found
0xF4	Recovery firmware image is loaded
0xF5 – 0xF7	Reserved for future AML progress codes
Recovery Error Codes	
0xF8	Recovery PPI is not available
0xF9	Recovery capsule is not found
0xFA	Invalid recovery capsule
0xFB – 0xFF	Reserved for future AML error codes

#### PEI Beep Codes

# of Beeps	Description
1 (repeatedly)	Memory not installed
1	Memory was installed twice (InstallPEIMemory routine in PEI Core called twice)
2	Recovery started
3	DXE IPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

#### DXE Phase

Status Code	Description
0x60	DXE Core is started
0x61	NVRAM initialization
0x62	Installation of the South Bridge Runtime Services
0x63	CPU DXE initialization is started
0x64	CPU DXE initialization (CPU module specific)
0x65	CPU DXE initialization (CPU module specific)
0x66	CPU DXE initialization (CPU module specific)
0x67	CPU DXE initialization (CPU module specific)
0x68	PCI host bridge initialization
0x69	North Bridge DXE initialization is started
0x6A	North Bridge DXE SMM initialization is started
0x6B	North Bridge DXE initialization (North Bridge module specific)

Status Code	Description
0x6C	North Bridge DXE initialization (North Bridge module specific)
0x6D	North Bridge DXE initialization (North Bridge module specific)
0x6E	North Bridge DXE initialization (North Bridge module specific)
0x6F	North Bridge DXE initialization (North Bridge module specific)
0x70	South Bridge DXE initialization is started
0x71	South Bridge DXE SMM initialization is started
0x72	South Bridge devices initialization
0x73	South Bridge DXE initialization (South Bridge module specific)
0x74	South Bridge DXE initialization (South Bridge module specific)
0x75	South Bridge DXE initialization (South Bridge module specific)
0x76	South Bridge DXE initialization (South Bridge module specific)
0x77	South Bridge DXE initialization (South Bridge module specific)
0x78	ACPI module initialization
0x79	CSM initialization
0x7A – 0x7F	Reserved for future AMI DXE codes
0x80 – 0x8F	OEM DXE initialization codes
0x90	Boot Device Selection (BDS) phase is started
0x91	Driver connecting is started
0x92	PCI Bus initialization is started
0x93	PCI Bus Hot Plug Controller initialization
0x94	PCI Bus Enumeration
0x95	PCI BUS Request Resources
0x96	PCI Bus Assign Resources
0x97	Console Output devices connect
0x98	Console Input devices connect
0x99	Super IO initialization
0x9A	USB initialization is started
0x9B	USB Reset
0x9C	USB Detect
0x9D	USB Enable
0x9E -0x9F	Reserved for future AMI codes
0xA0	IDE initialization is started
0xA1	IDE Reset
0xA2	IDE Detect
0xA3	IDE Enable
0xA4	SCSI initialization is started

Status Code	Description
0xA5	SCSI Reset
0xA6	SCSI Detect
0xA7	SCSI Enable
0xA8	Setup Verifying Password
0xA9	Start of Setup
0xAA	Reserved for ASL (see ASL Status Codes section below)
0xAB	Setup Input Wait
0xAC	Reserved for ASL (see ASL Status Codes section below)
0xAD	Ready To Boot event
0xAE	Legacy Boot event
0xAF	Exit Boot Services event
0xB0	Runtime Set Virtual Address MAP Begin
0xB1	Runtime Set Virtual Address MAP End
0xB2	Legacy Option ROM initialization
0xB3	System Reset
0xB4	USB hot plug
0xB5	PCI bus hot plug
0xB6	Clean-up of NVRAM
0xB7	Configuration Reset (reset of NVRAM settings)
0xB8 – 0xBF	Reserved for future AMI codes
0xC0 – 0xCF	OEM BDS initialization codes
<b>DXE Error Codes</b>	
0xD0	CPU initialization error
0xD1	North Bridge initialization error
0xD2	South Bridge initialization error
0xD3	Some of the Architectural Protocols are not available
0xD4	PCI resource allocation error. Out of Resources
0xD5	No Space for Legacy Option ROM
0xD6	No Console Output Devices are found
0xD7	No Console Input Devices are found
0xD8	Invalid password
0xD9	Error loading Boot Option (LoadImage returned error)
0xDA	Boot Option is failed (StartImage returned error)
0xDB	Flash update is failed
0xDC	Reset protocol is not available

## DXE Beep Codes

# of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met

## ACPI/ASL Checkpoints

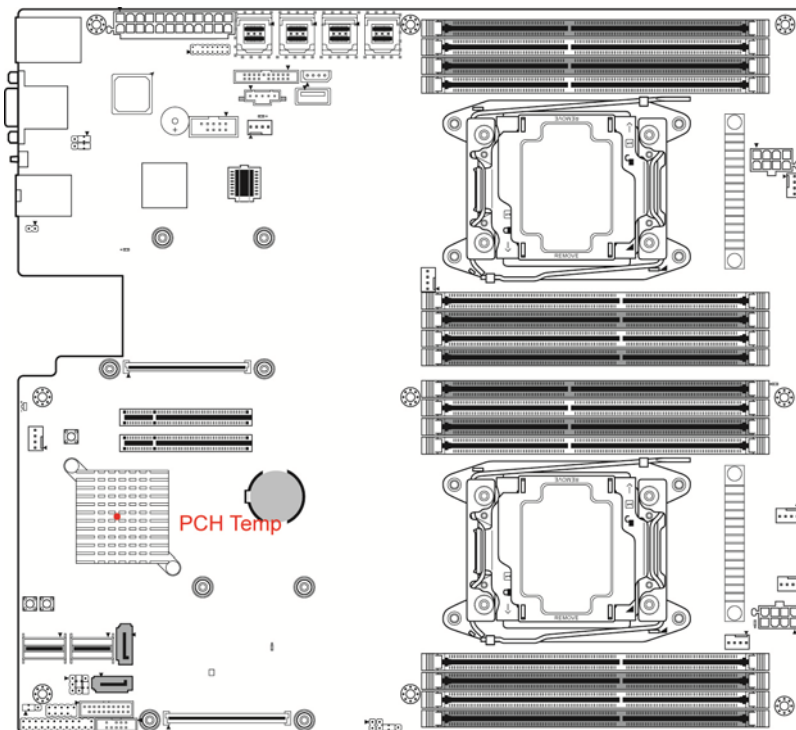
Status Code	Description
0x01	System is entering S1 sleep state
0x02	System is entering S2 sleep state
0x03	System is entering S3 sleep state
0x04	System is entering S4 sleep state
0x05	System is entering S5 sleep state
0x10	System is waking up from the S1 sleep state
0x20	System is waking up from the S2 sleep state
0x30	System is waking up from the S3 sleep state
0x40	System is waking up from the S4 sleep state
0xAC	System has transitioned into ACPI mode. Interrupt controller is in PIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.



## Appendix: Fan and Temp Sensors

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This section aims to help readers identify the locations of some specific FAN and Temp Sensors on the motherboard. A table of BIOS Temp sensor name explanation is also included for readers' reference.

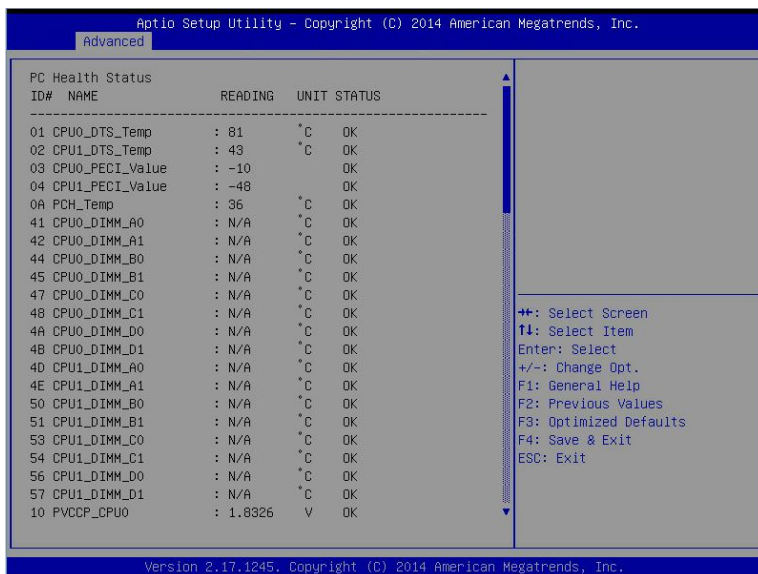


**NOTE:** The red mark indicates the sensor.

## Fan and Temp Sensor Location:

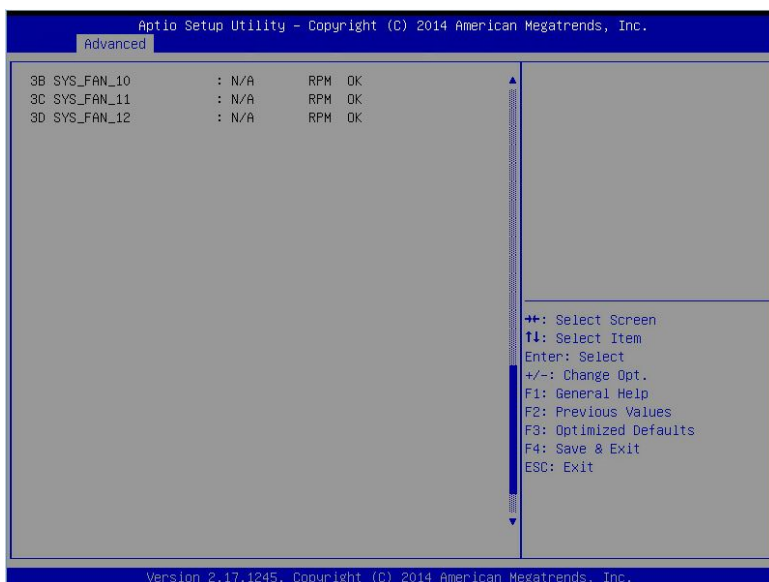
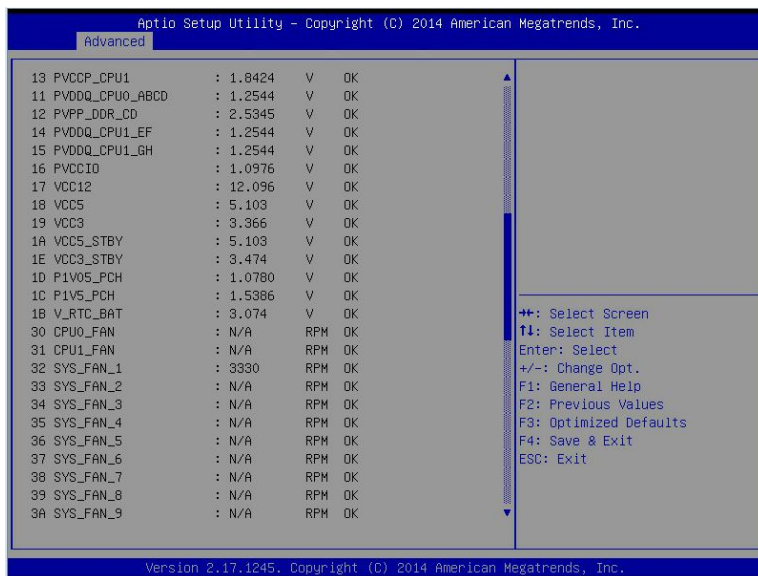
1. Fan Sensor: It is located in the **third** pin of the fan connector, which detects the fan speed (rpm)
2. Temp Sensor: **PCH Temp**. Temp sensor detects the system temperature around.  
**NOTE:** The system temperature is measured in a scale defined by **Intel**, not in Fahrenheit or Celsius.

## BIOS Temp Sensor Name Explanation:



The screenshot shows the 'Advanced' tab of the Aptio Setup Utility. The 'PC Health Status' section displays a table of sensor readings. The table has four columns: ID#, NAME, READING, and UNIT STATUS. The data includes CPU temperatures (01-04), PCH temperature (0A), DIMM temperatures (41-57), and PVCCP temperature (10). All units are in Celsius and show 'OK' status. A legend on the right explains navigation keys: F2 for Select Screen, F1 for Select Item, Enter for Select, +/- for Change Opt., F1 for General Help, F2 for Previous Values, F3 for Optimized Defaults, F4 for Save & Exit, and ESC for Exit. The footer indicates the version is 2.17.1245, Copyright (C) 2014 American Megatrends, Inc.

ID#	NAME	READING	UNIT	STATUS
01	CPU0_DTS_Temp	: 81	°C	OK
02	CPU1_DTS_Temp	: 43	°C	OK
03	CPU0_PECI_Value	: -10		OK
04	CPU1_PECI_Value	: -48		OK
0A	PCH_Temp	: 36	°C	OK
41	CPU0_DIMM_A0	: N/A	°C	OK
42	CPU0_DIMM_A1	: N/A	°C	OK
44	CPU0_DIMM_B0	: N/A	°C	OK
45	CPU0_DIMM_B1	: N/A	°C	OK
47	CPU0_DIMM_C0	: N/A	°C	OK
48	CPU0_DIMM_C1	: N/A	°C	OK
4A	CPU0_DIMM_D0	: N/A	°C	OK
4B	CPU0_DIMM_D1	: N/A	°C	OK
4D	CPU1_DIMM_A0	: N/A	°C	OK
4E	CPU1_DIMM_A1	: N/A	°C	OK
50	CPU1_DIMM_B0	: N/A	°C	OK
51	CPU1_DIMM_B1	: N/A	°C	OK
53	CPU1_DIMM_C0	: N/A	°C	OK
54	CPU1_DIMM_C1	: N/A	°C	OK
56	CPU1_DIMM_D0	: N/A	°C	OK
57	CPU1_DIMM_D1	: N/A	°C	OK
10	PVCCP_CPU0	: 1.8326	V	OK



<b>BIOS Temp Sensor</b>	<b>Name Explanation</b>
CPU0_DTS_Temp	Temperature of the CPU0 Digital Temperature Sensor
CPU1_DTS_Temp	Temperature of the CPU1 Digital Temperature Sensor
CPU0_PECI_Value	Temperature value of the CPU0 Platform Environment Control Interface (PECI)
CPU1_PECI_Value	Temperature value of the CPU1 Platform Environment Control Interface (PECI)
PCH_Area_Temp	Temperature of the PCH Area
CPU0_DIMM_A0	Temperature of CPU0 DIMM A0 Slot
CPU0_DIMM_A1	Temperature of CPU0 DIMM A1 Slot
CPU0_DIMM_B0	Temperature of CPU0 DIMM B0 Slot
CPU0_DIMM_B1	Temperature of CPU0 DIMM B1 Slot
CPU0_DIMM_C0	Temperature of CPU0 DIMM C0 Slot
CPU0_DIMM_C1	Temperature of CPU0 DIMM C1 Slot
CPU0_DIMM_D0	Temperature of CPU0 DIMM D0 Slot
CPU0_DIMM_D1	Temperature of CPU0 DIMM D1 Slot
CPU1_DIMM_A0	Temperature of CPU1 DIMM A0 Slot
CPU1_DIMM_A1	Temperature of CPU1 DIMM A1 Slot
CPU1_DIMM_B0	Temperature of CPU1 DIMM B0 Slot
CPU1_DIMM_B1	Temperature of CPU1 DIMM B1 Slot
CPU1_DIMM_C0	Temperature of CPU1 DIMM C0 Slot
CPU1_DIMM_C1	Temperature of CPU1 DIMM C1 Slot
CPU1_DIMM_D0	Temperature of CPU1 DIMM D0 Slot
CPU1_DIMM_D1	Temperature of CPU1 DIMM D1 Slot
CPU0_FAN	Fan Speed of CPU0_Fan
CPU1_FAN	Fan Speed of CPU1_Fan
SYS_FAN_1	Fan Speed of SYS_FAN_1
SYS_FAN_2	Fan Speed of SYS_FAN_2
SYS_FAN_3	Fan Speed of SYS_FAN_3
SYS_FAN_4	Fan Speed of SYS_FAN_4
SYS_FAN_5	Fan Speed of SYS_FAN_5
SYS_FAN_6	Fan Speed of SYS_FAN_6
SYS_FAN_7	Fan Speed of SYS_FAN_7
SYS_FAN_8	Fan Speed of SYS_FAN_8
SYS_FAN_9	Fan Speed of SYS_FAN_9
SYS_FAN_10	Fan Speed of SYS_FAN_10
SYS_FAN_11	Fan Speed of SYS_FAN_11
SYS_FAN_12	Fan Speed of SYS_FAN_12

# Glossary

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**ACPI (Advanced Configuration and Power Interface):** a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

**AGP (Accelerated Graphics Port):** a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

**ATAPI (AT Attachment Packet Interface):** also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

**ATX:** the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

**Bandwidth:** refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

**BBS (BIOS Boot Specification):** a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails. At that point, the next IPL device is called upon to attempt loading of the OS.

**BIOS (Basic Input/Output System):** the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

**Buffer:** a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

**Bus:** a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

**Bus mastering:** allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

**Cache:** a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

**Closed and open jumpers:** jumpers and jumper pins are active when they are “on” or “closed”, and inactive when they are “off” or “open”.

**CMOS (Complementary Metal-Oxide Semiconductors):** chips that hold the basic startup information for the BIOS.

**COM port:** another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

**DDR (Double Data Rate):** a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

**DIMM (Dual In-line Memory Module):** faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

**DIMM bank:** sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

**DMA (Direct Memory Access):** channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

**DRAM (Dynamic RAM):** widely available, very affordable form of RAM which loses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

**ECC (Error Correction Code or Error Checking and Correcting):** allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

**EEPROM (Electrically Erasable Programmable ROM):** also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN®'s BIOS updates can be found at <http://www.tyan.com>

**ESCD (Extended System Configuration Data):** a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

**Firmware:** low-level software that controls the system hardware.

**Form factor:** an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

**Global timer:** onboard hardware timer, such as the Real-Time Clock (RTC).

**HDD:** stands for Hard Disk Drive, a type of fixed drive.

**H-SYNC:** controls the horizontal synchronization/properties of the monitor.

**HyperTransport™:** a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

**IC (Integrated Circuit):** the formal name for the computer chip.

**IDE (Integrated Device/Drive Electronics):** a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

**IDE INT (IDE Interrupt):** Hardware interrupt signal that goes to the IDE.

**I/O (Input/Output):** the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

**IRQ (Interrupt Request):** an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

**Latency:** the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

**NVRAM:** ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

**Parallel port:** transmits the bits of a byte on eight different wires at the same time.

**PCI (Peripheral Component Interconnect):** a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

**PCI PIO (PCI Programmable Input/Output) modes:** the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

**PCI-to-PCI Bridge:** allows you to connect multiple PCI devices onto one PCI slot.

**Pipeline burst SRAM:** a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

**PnP (Plug-n-Play):** a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

**PXE (Preboot Execution Environment):** one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.



**RAID (Redundant Array of Independent Disks):** a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 10 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

**RAIDIOS: RAID I/O Steering (Intel)**

**RAM (Random Access Memory):** technically refers to a type of memory where any byte can be accessed without touching the adjacent data and is often referred to the system's main memory. This memory is available to any program running on the computer.

**ROM (Read-Only Memory):** a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

**SDRAM (Synchronous Dynamic RAM):** called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

**Serial port:** called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

**SCSI Interrupt Steering Logic (SISL):** Architecture that allows a RAID controller, such as AcceleRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic (LSI) (only on LSI SCSI boards)

**Sleep/Suspend mode:** in this mode, all devices except the CPU shut down.

**SDRAM (Static RAM):** unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

**SLI (Scalable Link Interface):** NVIDIA SLI technology links two graphics cards together to provide scalability and increased performance. NVIDIA SLI takes advantage of the increased bandwidth of the PCI Express bus architecture, and features hardware and software innovations within NVIDIA GPUs (graphics processing units) and NVIDIA MCPs (media and communications processors). Depending on the application, NVIDIA SLI can deliver as much as two times the performance of a single GPU configuration.

**Standby mode:** in this mode, the video and hard drives shut down; all other devices continue to operate normally.

**UltraDMA-33/66/100:** a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

**USB (Universal Serial Bus):** a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

**VGA (Video Graphics Array):** the PC video display standard

**V-SYNC:** controls the vertical scanning properties of the monitor.

**ZCR (Zero Channel RAID):** PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

**ZIF Socket (Zero Insertion Force socket):** these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding it into the board and locking it into place.

# Technical Support

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If a problem arises with your system, you should first turn to your dealer for direct support. Your system has most likely been configured or designed by them and they should have the best idea of what hardware and software your system contains. Hence, they should be of the most assistance for you. Furthermore, if you purchased your system from a dealer near you, take the system to them directly to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

If these options are not available for you then TYAN can help. Besides designing innovative and quality products for over a decade, TYAN has continuously offered customers service beyond their expectations. TYAN's website ([www.tyan.com](http://www.tyan.com)) provides easy-to-access FAQ searches and online Trouble Ticket creation as well as Instant Chat capabilities with our Support Agents. TYAN also provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find the latest software and operating system components to keep their systems running as powerful and productive as possible. TYAN also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, TYAN serves multiple market segments with the industry's most competitive services to support them.

**"TYAN's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general" - Anandtech.com**

## Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN website for FAQ's, bulletins, driver updates, and other information: <http://www.tyan.com>
3. Contact your dealer for help BEFORE calling TYAN.
4. Check the TYAN user group:  
[alt.comp.periphs.mainboard.TYAN](http://alt.comp.periphs.mainboard.TYAN)

## Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

**NOTE:**

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number Should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN will pay to have the board shipped back to you.

**Notice for the USA**

Compliance Information Statement (Declaration of Conformity Procedure) DoC

FCC Part 15: This device complies with part 15 of the FCC Rules

**Operation is subject to the following conditions:**

This device may not cause harmful interference, and this device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and the receiver.

Plug the equipment into an outlet on a circuit different from that of the receiver.

Consult the dealer on an experienced radio/television technician for help.

**Notice for Canada**

This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux norms de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'ineteferece radio.)

**CAUTION:** Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. There is danger of an explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

Document #: D2280-100